

The Washington State Weatherization Plus Health Pilot: Implementation and Lessons Learned

Prepared for:

Energy Division
Washington Department of Commerce

Prepared by:

Vince Schueler
Washington State University Energy Program

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Energy Program

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Abbreviations

ACH	Accountable Communities of Health
BMAC	Blue Mountain Action Council
BPA	Bonneville Power Administration
CAP	Community Action Program
CHW	Community Health Worker
Commerce	Washington State Department of Commerce
DOE	U.S. Department of Energy
FY	Fiscal year
HH	Healthy homes
IMC	Installed measure cost
KCHA	King County Housing Authority
LI	Low-income
LIHEAP	U.S. Dept. of Health and Human Services Low-Income Home Energy Assistance Program
OPPCO	The Opportunity Council
PCHS	Pierce County Human Services
PSS	Pollution Source Survey
SCHS	Snohomish County Human Services
SKCPH	Seattle King County Public Health
SNAP	Spokane Neighborhood Action Program
SSN	Social security number
TPCPH	Tacoma Pierce County Public Health
Wx+H	Weatherization Plus Health
YNHA	Yakama Nation Housing Authority
YVFWC	Yakima Valley Farm Workers Clinic

Executive Summary

Washington State has been a national leader in the effort to integrate weatherization and healthy homes (HH) services to address asthma and respiratory health. Two Washington low-income weatherization agencies, the Opportunity Council and the King County Housing Authority (in partnership with Seattle King County Public Health), were part of pioneering pilot projects establishing the potential of comprehensive weatherization and home visits to improve occupant health and decrease healthcare costs.¹

On the strength of this work and the increasing awareness of the link between substandard housing and health, in 2015 the Washington State Legislature passed HB 1720. HB 1720 expanded the focus of the Matchmaker Low-Income (LI) Weatherization Program beyond energy efficiency to include healthy housing improvements. The Legislature increased overall Matchmaker funding for the July 2015-June 2017 biennium with the expectation that the increase would support this new mandate.

The Washington State Department of Commerce (Commerce) vision for the Weatherization Plus Health (Wx+H) Initiative is to integrate weatherization, health, and social services so that all Washington state low-income housing is energy efficient, safe, healthy and durable. To achieve this vision, Commerce set four long-term goals and associated nearer-term objectives:

1. Create a collaborative infrastructure for implementing integrated weatherization and HH services.
 - Create and maintain partnerships with other community medical and public health entities to deliver services, leverage resources, and improve outreach.
2. Demonstrate the feasibility and benefits of delivering integrated Wx+H services.
 - Document the services and measures delivered.
 - Identify the costs to deliver these services and measures.
 - Assess effectiveness at reaching high-priority households.
3. Develop approaches for delivering integrated Wx+H services.
 - Assess whether agencies were able to effectively integrate weatherization, HH measures, and education, and deliver the model as initially proposed.
 - Test different approaches for delivering Wx+H services.
 - Identify and standardize delivery models and best practices.
4. Increase the number and capacity of agencies able to deliver these services.
 - Build agency capacity to deliver services.
 - Leverage community resources (services and funding).
 - Assess whether the integrated Wx+H model is replicable in all statewide LI Weatherization agencies.

Commerce deployed two strategies to reach these goals: Enhanced and Basic Wx+H.

The Enhanced Wx+H program is the primary focus of this report. Under the program, \$2.3 million was designated for competitive grants to weatherization agencies to establish community partnerships and to develop, test, and deploy new strategies with these partners to deliver these services. The enhanced grant projects would:

¹ Rose et al., 2015; Breyse et al., 2014

- Focus services on households and people with asthma and other respiratory conditions.
- Encourage multi-faceted or comprehensive interventions (weatherization, HH measures, education, and follow-up visits) to increase the ability to detect health outcomes.
- Encourage innovation and flexibility in program design, partnerships, and delivery models. The expectation was that pilot projects would be used to develop and refine standard practices for subsequent funding cycles.

Basic Wx+H: \$2 million was allocated by formula to all agencies. Agencies had the option to use funds for weatherization, or to develop capacity to deliver Wx+H services, or install a subset of HH measures in homes eligible for weatherization services. Basic Wx+H funding was not broadly used for delivering Wx+H services. Basic Wx+H results are covered in the final section of this report.

Project Background

In September 2015, Commerce released a competitive Request for Application (RFA) for the Enhanced Wx+H pilot. Twelve agencies applied; six agencies were awarded grants in February and March 2016:

- The Opportunity Council (OPPCO)
- Pierce County Human Services (PCHS)/Tacoma Pierce County Public Health (TPCPH)
- Yakima Valley Farm Workers Clinic (YVFWC)
- Spokane Neighborhood Action Partners (SNAP)
- Snohomish County Human Services (SCHS)
- King County Housing Authority (KCHA)/Seattle King County Public Health (SKCPH)

Two agencies that applied but were not initially selected for funding were subsequently given small startup grants:

- Blue Mountain Action Council (BMAC)
- Yakama Nation Housing Authority (YNHA)

The grantees and details of their awards are listed in [Table 2](#). A detailed profile of each grantee is provided in Attachment 3.

The Enhanced Wx+H grantees were drawn from among the largest and most experienced state weatherization agencies. Five of the eight enhanced grantees had prior experience with HH services. Large urban agencies were much more likely to apply for and receive grants than smaller rural agencies. Enhanced Wx+H grantees were more likely to have capacity to start up and deliver complex program services than typical weatherization agencies.

The use of a competitive RFA and contracting process compressed the two-year program to 15 months. Local challenges with program start up, and finding and signing contractors for HH measures, compressed the schedule still further so that most projects and the work of the program was completed in the final six months of fiscal year (FY) 2015-17.

Establishing Community Partnerships

All eight grantees established partnerships with public health agencies, medical clinics, and other community organizations. All grantees reported that the Wx+H model and the potential health benefits associated with it were compelling and there was strong support for the approach in the community.

They also reported that Wx+H helped raise the profile of all weatherization services among stakeholders.

Three grantees partnered with public health agencies or clinics with Community Health Worker (CHW) on staff and established contracts for medical home visit services. CHW partnerships provide a more integrated service model. Education and follow-up visits were more likely to include medical case management-related services. Typically under the CHW model, two or more initial home visits for screening, asthma management, and relationship building occur prior to referral. Intake into weatherization and HH assessment follow these initial screening visits.

The remaining grantees included community health partners for consultation and referrals, but provided all program services (weatherization, HH measures, and home visits/education) in-house through weatherization program staff. Agencies that relied on internal staff for education efforts focused education on energy efficiency, HH measures, and environmental triggers. They were less likely to provide case management services or address health and medication management issues because internal staff did not have the skills and training to do so.

Community partnerships, while valuable, were not an effective or reliable source of actionable referrals for comprehensive weatherization services. Only 23% of completed projects originated from referrals from community partners. Many of the referrals from community partners did not match weatherization program eligibility criteria. Many referrals were not able or willing to complete the weatherization application process. Despite these initial setbacks, all grantees indicated interest in maintaining ongoing referral arrangements with community partners, especially medical and public health organizations.

The Wx+H grantees had limited success leveraging community funding for HH services, measures, or repairs. Two grantees (YVFWC and KCHA) had modest success leveraging home visit services and low-cost measures. Other grantees had some in-kind assistance and support from community partners. The value of this leverage is estimated at \$200-300,000, or about 10% of Enhanced Wx+H funding. Only about \$45,000 (or 2%) of measure costs for Wx+H projects were leveraged from community partners. The largest barrier to leveraging resources was the lack of time for building relationships and the compressed timeline for completing the projects.

Four of the eight grantees had modest success gaining initial entry into the Medicaid Waiver/ACH process, and gaining general support for coordination of services. There remains long-term potential for closer integration, but few concrete initiatives or direct funding for Wx+H services are likely in the next biennium.

Finally, grantees noted that maintaining community partnerships requires dedicated time and staff capacity. There was insufficient time and staff capacity to maintain partner relationships within the limits of the grant period. The lack of long-term, stable Wx+H funding further complicated efforts to establish and maintain these relationships.

Feasibility and Outcomes

Weatherization agencies were effective at installing HH and weatherization measures in homes.

Enhanced Wx+H grants funded measures and services in 254 homes ([Figure 4](#)).

- 159 households received a comprehensive package of weatherization and HH measures. All households received initial home visits for assessments.
- 63 homes that were previously weatherized or did not need weatherization measures received only HH measures. A typical HH-only project included low-cost HH measures and one to three other measures from the Enhanced Wx+H list. Most HH-only projects were under the Wx+H Enhanced cost cap of \$4,000.
- 32 homes received low-cost HH measures under \$500. Typical low-cost HH recipients were those who received initial assessments and home visits but were screened out or dropped out before receiving comprehensive weatherization and HH measure packages. These households did not receive post-installation follow-up visits through the Wx+H grant.

An additional 211 homes received services that were fully leveraged (paid for) by community partners. Most of these households received low-cost HH measures.

The pilot documented significant need and demand for Wx+H services among existing weatherization clients. All agencies were able to meet and, in some cases, exceed their targets for completing comprehensive upgrades. When referral partnerships did not yield hoped-for results, grantees were able to find clients with respiratory conditions among existing applicants. Although not measured rigorously, grantee observations and Wx+H penetration data suggest that between 20% and 40% of clients are medically vulnerable.

Measures: Almost all (94%) of Enhanced Wx+H clients received lower-cost Wx+H measures including green cleaning kits ([Table 8](#)). Two out of three received dust mite covers, walk-off mats, HEPA vacuums, and smoke detectors. Of the higher-cost measures, the most commonly installed measure was carpet removal and replacement with low-VOC flooring. This measure was installed in 32% of comprehensive installation and 52% of HH-only projects. Other higher-cost measures such as advanced ventilation, plumbing repairs, roof replacement, pest mitigation, and mold and moisture abatement were installed in 10% to 20% of comprehensive projects. There was wide variation among grantees reflecting locally available contracting infrastructure and costs. Grantees reported that it was common to scale back or exclude one or more potential HH measure from scopes of work to meet cost caps. This was especially true for grantees in high-cost locations or those serving high-need customers.

Few agencies took advantage of the option to install additional prescriptive Basic Wx+H measures. Less than 5% of Basic Wx+H funding was spent on measures that were not already eligible for funding through pre-existing weatherization contracting infrastructure.

Costs: The median unit cost for additional Wx+H measures was \$3,075. The total installed measure cost (IMC) including weatherization, health and safety, and repair measures ranged from \$74 to \$44,003 for all Wx+H upgrades ([Figure 12](#))Figure 12Figure 12Figure 12. The median IMC for all projects was \$9,227. The median total cost for a comprehensive Wx+H project was \$14,244. HH-only projects cost \$3,288. Education and low-cost projects cost \$461.

Delivery of Wx+H Services

All eight enhanced grantees were effective at reaching households with medical needs and installing the weatherization and HH measures. They were less effective at delivering on HH assessments, home visits, and service integration features that are considered essential parts of multi-faceted HH interventions.

Enhanced grantees succeeded in reaching households with medical needs. All grantees documented that households receiving Wx+H services had one or more members with respiratory health conditions. Three of eight grantees had specific strategies for identifying and prioritizing high-need households that applied to all or most clients. The remaining grantees focused on providing services to existing weatherization and energy assistance clients who provided documentation of respiratory conditions. Grantees developed new intake practices, such as adding respiratory health screening questions to intake processes and training assessment staff to look for indicators of respiratory conditions (e.g., oxygen tanks) while screening existing applicants. Because of the shift in focus for many grantees to existing weatherization and energy assistance applicants, there was a higher incidence of households with COPD or other non-asthma respiratory health conditions than initially expected because weatherization clients are more likely to be elderly.

Weatherization program requirements for landlord participation make it challenging to serve rental units. Almost all (92%) units served were single-family, owner-occupied units ([Table 15](#)). In contrast, 30% of Washington households under 125% of the Federal Poverty Level are owner-occupied.

Grantees were less effective at delivering HH assessment and home visit/education services. HH Essentials Training was required for those serving Wx+H clients. While valuable, the Essentials training focused primarily on addressing the building, not on addressing the specific education needs of clients with respiratory conditions. Standardized assessment and education tools were not available for grantees because of the diversity of tools and practices of community partners, and because there was not time or capacity at Commerce or the WSU Energy Program to develop and deliver them without further delaying pilot start up. Standardization was deferred to the next program cycle.

Five of eight grantees did not partner with entities that provided medical home visits.

Grantees that did not work with a public health or medical clinic, or pursue additional public health training, were not equipped to address the specific needs of clients with respiratory conditions. Three agencies without these partnerships focused primarily on installing additional measures, and did not have a structured and comprehensive curriculum to address environmental triggers; encourage behavior change; or address medication, other health conditions, or social service needs. The remaining two addressed behavior change issues but were not able to effectively integrate asthma/COPD control strategies into education offerings.

Weatherization agencies reported that they had limited experience working with and managing client health data and, in particular, understanding and meeting Health Insurance Portability and Accountability Act (HIPAA) compliance issues. All grantees, including those with a CHW partner found they were not well trained to address clients with co-morbid conditions, especially clients with mental health concerns, such as hoarding or depression.

Delivery of HH assessment services was inconsistent and hampered by use of an outdated assessment tool that was not adequate for documenting client needs and household hazards. OPPCO revised and significantly improved the assessment tool during the pilot. Use of the revised HH assessment statewide is recommended as a best practice.

Although all agencies qualified projects on the basis of medical need and completed HH assessments, medical need and HH assessments were not a major driver for scopes of work for installed measures. Only two grantees (Pierce County and SNAP) had structured processes for sharing information from HH visits to inform service plans and scopes of work, which was a best practice. Both agencies and CHWs indicated they lacked tools and resources to make evidence-based recommendations for prioritizing HH or weatherization investments, and tailoring them to address specific health concerns.

Grantees and partners valued the opportunity for client follow up. The lack of clear guidance on whether the clock for follow-up starts with initial assessment or with final measure installation resulted in inconsistent delivery of follow-up visits. Loss of funding from July to December 2017 resulted in almost half of completed projects missing one or more scheduled follow-up visit.

Capacity and Sustainability

All grantees noted that it was very difficult to establish and maintain capacity to deliver Wx+H services when resources and funding for the work was available in a time-limited window. The eight enhanced grantees included the largest weatherization agencies, those with the greatest executive commitment to the Wx+H model, or those with some experience in delivering HH services. The grantees were in a stronger position than many local agencies to deliver Wx+H services – and all encountered major challenges in deploying the Wx+H models. Six of the eight grantees experienced turnover of executive sponsors, administrative leads, and/or agency champions, which increased these challenges.

Despite these challenges, there was general support among grantees for having flexibility to install Wx+H measures with Matchmaker funding on an ongoing basis – regardless of whether there was extra or dedicated funding. Six of eight grantees indicated they would likely do so if given the option. Four of the eight grantees indicated they are likely to continue to offer integrated Wx+H services and with fully engaged community partners. Given current Wx+H funding levels and local capacity, integrated Wx+H service delivery is not yet ready for statewide deployment.

Current Matchmaker funding is not sufficient to address high-need/high-cost households as a general practice. Evidence from data and grantee interviews indicates that most projects had one or more measure that was not done or was scaled back to fit within the Commerce spending caps. About one in five comprehensive projects was in “high intervention” homes. Costs for high-need homes were typically two to four times higher than the statewide average and median unit costs for weatherization. Given limited funding, there is a need to place caps on Wx+H expenditures. Some additional flexibility with Wx+H spending would be beneficial. Commerce may want to consider allowing additional funds to be expended for HH and repair measures in cases with exceptional need.

Prevailing wage requirements significantly delayed local agencies in securing contractor capacity needed to install Enhanced Wx+H measures, and increased costs. The major concern was not increased wages but rather, the administrative and reporting requirements that are attached to these rules. These

requirements significantly and negatively affected the availability to secure contractor capacity and had a direct impact on what types of HH measures were available to clients.

Although Wx+H is generating useful case study data on health benefits, the goal of providing a broad demonstration across multiple agencies was not consistent with the goal of conducting rigorous research to establish the effectiveness of these interventions on healthcare utilization. Most weatherization agencies do not have the capacity, systems, and staffing to capture and maintain the data needed for this work. A particular concern was the need for training and specific guidance on HIPAA compliance in the capture, storage, and sharing of data to establish eligibility and need, and to document potential outcomes. Insufficient time and funding were available to standardize data collection tools and protocols, particularly those used to collect data on the behavior and self-reported health outcomes of clients.

Recommendations

Community partnerships and referral relationships should be encouraged as a longer-term strategy for building and maintaining support for weatherization services in communities. Agencies should have the option to work with public health partners to provide screening and follow-up home visits because weatherization agencies are not ready to provide them consistently and do not have the training to address health and medical issues. In the absence of stable, dedicated, and multi-year funding for Wx+H services, agencies should be encouraged but not required to establish formal community partnerships for referrals or for providing home visit services before receiving Matchmaker Wx+H funding. Commerce should allow use of general program support funding from the Matchmaker budget to pay for follow-up visits.

Develop a low-cost option for home visit measures (cleaning kits, vacuums, bedding) targeted to the occupants of rental units, which would not require landlord engagement and could be an alternative to comprehensive services.

Establish clear guidance and standard curriculum and materials for Wx+H client education and HH Assessment. Sample curricula, protocols, and tools should be developed that address the special demands of working with clients with asthma and COPD. Training protocols should address training requirements and roles for both healthy homes environment trigger assessments and for Community Health Worker home visit services. The existing HH assessment tool – the Pollution Source Survey (PSS) – should be further refined and the updated tool should be used for all weatherization assessments.

Provide additional guidance to agencies and their partners on developing appropriate scopes of work and prioritizing which physical weatherization and HH interventions are likely to yield better health outcomes. These physical interventions must take into account both the health challenges of clients and the physical condition of the building. Given the tremendous diversity in occupant and building needs, it is not feasible to establish highly structured protocols. However, additional general guidance on strategy and priorities given limited funds would be helpful.

Provide additional information, resources, and support to identify HH products and contractors to agencies and their partners. Explore the possibility of statewide contracts for hard-to-find services. Commerce and local agencies have identified prevailing wage reporting requirements as a significant

driver of contracting costs and an impediment to securing a diverse, cost-competitive contractor network in a timely manner. Commerce and local agencies should pursue relief from prevailing wage reporting requirements.

Maintain and adjust caps on Wx+H expenditures. FY 2018-19 Matchmaker funding is not sufficient to address high-need/high-cost households as a general practice. Some additional flexibility with Wx+H spending, in the form of increasing the cap from \$4,000 or allowing agencies to manage Wx+H to an average cost per unit, would be beneficial.

The Basic Wx+H option should be phased out. The 14 measures on the basic measure list should be reviewed. A limited number of new low-cost measures (such as walk-off mats; green cleaning kits; and measures to reduce slips, trips and falls) may be added as optional health and safety measures.

To allow some sustained effort over time, the Wx+H services should be integrated into existing services rather than offered as a stand-alone program. Given uncertainty in any individual funding stream, Commerce should allow other funding sources, such as the U.S. Department of Health and Human Services Low-Income Home Energy Assistance Program (LIHEAP), to be used for Wx+H measures to the extent permissible under the rules governing these funding sources.

If the Legislature does provide increased and dedicated funding for the purpose of directly measuring health benefits, we recommend focusing investments in no more than three agencies with the specific charge of developing standardized assessment and data collection instruments.

Conclusions

The Wx+H program raised the awareness and visibility of the connection between substandard housing and occupant health among community partners and grantee agencies. As one Weatherization Program Manager reported, “It opened our eyes to the need to address the health needs of our clients in our work and that our staff currently do not have skills and capacity to do this.”

All eight grantees started the work of building community partnerships. As highlighted in the grantee profiles, grantees struggled to establish and maintain these partnerships in the face of and unpredictable grant funding and staff turnover. The three grantees that contracted for home visit services also struggled to integrate information systems sharing and culture across organizations. Despite these challenges, community partnerships were seen as valuable and worth continued development.

Grantees clearly established that there is significant need and demand for HH measures and services among existing weatherization and energy assistance clients. They were very effective at integrating HH measures into existing weatherization installations.

Grantees were less effective at integrating HH assessments, education, and follow-up services into program delivery. Weatherization program staff do not have training, expertise, or comfort with addressing medical (medication management) or social service needs. If services were not provided by a CHW, these issues were not addressed. The focus of the next Wx+H cycle should be on standardizing assessment and education tools, and strengthening the capacity of weatherization staff to address the occupants – not just on building systems. This is a big leap. In the absence of stable, multi-year funding, it is not likely that most weatherization agencies will develop the capacity or expertise to offer the full

Wx+H integrated service model. Given reduced Wx+H funding through the Matchmaker Program, Commerce will focus FY 2018-19 funding on installing physical Wx+H measures in the homes of medically vulnerable clients and will limit direct investment in provision of CHW home visit services for medical screening and follow-ups either by local agency staff or community partners. Given the value of these services, local agencies receiving Wx+H funds are strongly encouraged to develop and strengthen community partnerships and finding alternative funding sources provides these services to clients.

Measure costs for comprehensive Wx+H upgrades are considerable, especially when addressing high-needs households. High unit costs make it challenging to scale up service or address hard-to-reach rental markets. Long-term sustainability may hinge on finding lower-cost alternatives for delivering Wx+H services.

Despite these challenges, there is sufficient evidence to suggest that:

- Many existing low-income weatherization clients are medically vulnerable,
- Investments in Wx+H measures result in significant and positive health outcomes, and
- Considerable non-energy benefits are likely to meet or exceed measure costs.

Ultimately, weatherization agencies have a long way to go before they can deliver a sufficiently standardized service, product, or cost structure across the state that would be medically reimbursable and scalable. This initial report suggests that it is a feasible, long-term goal that is still worth pursuing.

Introduction

Washington has been a national leader in the effort to integrate weatherization (Wx) and Healthy Homes (HH) services to address asthma and respiratory health. Two of Washington's Low-Income Weatherization agencies, the Opportunity Council and the King County Housing Authority (in partnership with Seattle King County Public Health) were part of pioneering pilot projects that established the potential of comprehensive weatherization and home visits to improve occupant health and decrease healthcare costs.² On the strength of this work and the increasing awareness of the link between substandard housing and health, the Washington State Legislature in 2015 passed HB 1720, which expanded the focus of the Matchmaker Low-Income (LI) Weatherization Program beyond energy efficiency to include healthy housing improvements. The Legislature increased overall Matchmaker funding by \$5 million for the July 2015-June 2017 biennium with the expectation that this increase would be used to support this expanded mandate.

The Washington State Department of Commerce (Commerce) drew on the best practices and lessons learned from multi-faceted national asthma programs³ and Washington state asthma programs to develop a statewide initiative to integrate HH interventions into Washington's existing low-income weatherization delivery system. Subsequent nation-wide summaries of the research on the health benefits of weatherization further solidified the evidence base for this strategy.⁴

The vision of the Weatherization Plus Health (Wx+H) initiative is to:

1. Integrate investments in energy efficiency and health improvements in homes, and provide education and services to low-income households to reduce energy bills; increase home durability; and improve occupant health, safety, and wellbeing.
2. Create a collaborative and sustainable infrastructure for delivering integrated weatherization and HH services by demonstrating and maintaining partnerships with, and leveraging resources from, healthcare and other community partners.

The long-term objective for Wx+H is to support sustainable, long-term investment in low-income housing stock by making the case for continued legislative investment in, and Medicaid/Medicare reimbursement for, appropriate and cost-effective weatherization and HH repairs. Wx+H tested the feasibility of deploying the HH integrated service models across multiple local weatherization agencies statewide.

Commerce's goals, objectives, and strategy for the Wx+H Program are outlined in Figure 1. A more detailed logic model is provided as Attachment 1.

Commerce set aside \$4.3 million in new Matchmaker dollars to pilot two strategies:

- **Enhanced Wx+H:** \$2.3 million was designated for a limited number of competitive grants to weatherization agencies to initiate pilots. These pilots deployed comprehensive HH measures and asthma management services in partnership with community organizations or healthcare providers. The use of a competitive Request for Application (RFA) process presented a significant departure

² Rose et al., 2015; Breyse et al., 2014

³ Meyer, Morgan, and Nardone, 2015; Schueler, 2015; Hutnik et al., 2015

⁴ E4 the Future, 2016; Wilson et al. (US DOE), 2016; GHFI, 2017

from Washington's LI Weatherization Program, which had awarded most funding by formula-based allocation.

The initial focus of the Enhanced Wx+H grant was to assess the feasibility and effectiveness of integrating weatherization and HH services into Washington's existing low-income weatherization infrastructure. Enhanced grants were intended to be used to develop, test, and deploy new strategies and partnerships to deliver these services. The enhanced grant projects would:

- Focus on multi-faceted interventions for asthma and other respiratory conditions to ensure consistency and increase ability to detect and measure health outcomes.
 - Encourage innovation and flexibility in program design, partnerships, and approach in deploying these models (weatherization, HH measures, education, and follow-up visits). The expectation was that pilot projects would be used to develop and refine standard practices.
 - Encourage partnerships with other medical and public health entities to leverage resources and improve outreach.
- **Basic Wx+H:** An additional \$2 million was allocated by formula to all agencies. Agencies had the option of using funds for weatherization, additional repairs, developing capacity to deliver Wx+H services, or installing a subset of HH measures in homes eligible for weatherization services. The Basic Wx+H program and outcomes are summarized in the final section of this report.

Evaluation Approach

Commerce recognized that it was crucial to include evaluation and measurement in the program design. The Washington State University (WSU) Energy Program, which has provided program evaluation services and reporting for Washington's LI Weatherization Program since 2007, was selected to integrate ongoing program evaluation and "real-time" reporting services into the Wx+H program in the summer of 2015. The WSU Energy Program worked closely with Commerce staff and grantees to clarify program goals, identify performance measures, and establish performance reporting and program evaluation systems. Together, WSU Energy Program and Commerce staff identified the following research questions:

- What Wx+H services were delivered by the basic and enhanced programs?
- Was funding sufficient to address demand for projects? What was the unmet need?
- Who was served? Were Wx+H resources targeted to high-needs households?
- Was community capacity to deliver HH services increased?
- Were new partnerships and funding identified to target high-needs households, and coordinate and leverage additional services?
- What innovative approaches were tried and what was learned?
- What were the costs for measures and services? Do the benefits outweigh the costs?
- Is the Wx+H model viable and sustainable? What are the barriers to further progress?
- Is sufficient capacity available? Is there support for continuing work?
- How has Wx+H impacted those receiving services? Is there evidence of health benefits?

This Wx+ H Implementation Summary is the second of three evaluation reports for the Wx+H program. The first report, *Weatherization Plus Health Evaluation: Early Progress Report* (WSU Energy Program, 2016) covered the initial roll out of the program and summarized:

- Program goals and vision, performance measures, and logic models.
- Proposed implementation plans and delivery models of enhanced grantees, focusing on the current state of delivery models, and new program delivery strategies and partnerships. A detailed grant and partnership profile was prepared for each enhanced grantee.
- Challenges and lessons learned by enhanced grantees during initial roll out.
- Initial take up of basic and Enhanced Wx+H services.
- Lessons learned from the RFA and contracting processes.

This Wx+H Implementation Summary presents outcomes and lessons learned from the FY 2016-17 Enhanced and Basic Wx+H Program pilots. Specifically:

- What services were delivered by the enhanced and basic programs, and how did they compare to initial targets and expectations?
- Were agencies able to effectively integrate weatherization and HH measures and education, and deliver the model as initially proposed?
- Who was served? Were agencies successful at targeting high-needs households?
- Were agencies able to build community capacity and partnerships, and leverage resources and funding from them?
- What Wx+H services and measures were delivered by the basic and enhanced programs? How much did it cost to install measures and deliver services?
- What was tried, what was learned, and what should be built on going forward?
- Is the Wx+H model viable and sustainable? Is deploying multi-faceted home interventions to address respiratory or other health conditions at scale across multiple local weatherization agencies feasible within the Washington’s Low-Income Weatherization Network given agency capacity and likely funding? If not, what are alternative strategies for meeting the Matchmaker Program directive to address weatherization and home health in low-income households?

This evaluation draws on:

- Detailed tracking of participants and projects by grantees, including household characteristics and reason for targeting, condition of the home as reported in the Pollution Source Survey (PSS), education visits, leveraged resources, and project status. This data was reported monthly to the WSU Energy Program and reviewed for completion and consistency.
- Data on installed measures, costs, funding sources, and house characteristics from the Weatherization Information Data System matched to participant records.
- Quarterly check-in calls with grantees to share progress and lessons learned.
- Site visits and interviews with eight enhanced grantees conducted in May and June 2017. Site visits included visits to showcase or observe “in-process” projects.
- Five project profiles of specific upgrades and households served developed to illustrate typical installations (Attachment 2).
- Eight grantee profiles were developed, which summarize outcomes and final delivery model (Attachment 3).

A third and final report will be completed in the second half of 2018 to analyze the cost and benefits of the Wx+H program, with particular focus on health outcomes.

Figure 1. Washington Department of Commerce: Wx+H Mission, Goals, and Objectives

 <p>Our mission at Commerce is to grow and improve jobs in Washington State by championing thriving communities, a prosperous economy, and sustainable infrastructure.</p>	COMMERCE GOALS							
	 <p>GOAL</p> <p>Entrepreneurial Agency Culture</p>	 <p>GOAL</p> <p>Conscientious Stewardship</p>	 <p>GOAL</p> <p>Strong Partnerships</p>	 <p>GOAL</p> <p>Sustainable Energy</p>	 <p>GOAL</p> <p>Reliable & Sustainable Infrastructure</p>	 <p>GOAL</p> <p>Growing Economies</p>	 <p>GOAL</p> <p>Vibrant Communities</p>	
COMMERCE STRATEGIC PRIORITIES	PROGRAM GOALS FOR THE NEXT 3-10 YEARS							
 <p>Supporting and Assisting Businesses</p>	 <p>Supporting and Assisting Local Governments</p>	 <p>Supporting and Assisting Communities</p>	<ul style="list-style-type: none"> • Create a collaborative & sustainable infrastructure for implementing Wx+H • Establish innovative approaches to deliver integrated Wx+H services 		<ul style="list-style-type: none"> • Demonstrate the benefits of integrated Wx+H services to low income households • Sustain integrated Wx+H services that improve low income health and well being 			
COMMERCE VALUES	PROGRAM OBJECTIVES FOR THE NEXT 1-3 YEARS							
<p>Collaboration Quality Leadership Meaningful Results Passion</p>	<ul style="list-style-type: none"> • Demonstrate that partnerships can be formed and maintained with health care providers and other community partners to deliver Wx+H services 		<ul style="list-style-type: none"> • Test and demonstrate different approaches for integrating and effectively delivering Wx+H services • Standardize methods and best practices 		<ul style="list-style-type: none"> • Develop methods to measure and report the health benefits of Wx+H services • Report on the initial benefits received from Wx+H by low income households 		<ul style="list-style-type: none"> • Expand health services beyond asthma • Increase the number of agencies delivering Wx+H services • Obtain continued funding and support 	
Weatherization Plus Health	INITIATIVES							
<p>MISSION: <i>The Weatherization Plus Health Initiative (Wx+H) of the Weatherization Program makes cost effective energy efficiency improvements, related repairs, and appropriate health improvements to homes occupied by low income people to reduce energy bills, increase home durability, and improve occupant health, safety, and well-being.</i></p>	<ul style="list-style-type: none"> • Establish partnership agreements and delivery models • Conduct stakeholder engagement and coordination • Leverage community resources 		<ul style="list-style-type: none"> • Build the capacity of the weatherization network through training and tool development • Gain experience delivering health services and measures 		<ul style="list-style-type: none"> • Document services delivered • Evaluate program outcomes, costs, and benefits • Identify lessons learned • Report results to the legislature 		<ul style="list-style-type: none"> • Obtain referrals • Screen clients • Conduct audits and assessments • Install measures • Conduct education and follow up • Provide quality assurance 	
PROGRAM VISION AND VALUES	MEASURES							
<p>VISION: <i>Integrate weatherization, health, and social services so that all Washington State low-income housing is energy efficient, safe, healthy, and affordable.</i></p>	<ul style="list-style-type: none"> • Community partnerships formed • Leveraged services & funding • Delivery procedures and tools developed • Training and certifications received 		<ul style="list-style-type: none"> • Number of households served by Wx+H • Number of agencies delivering Wx+H services • Number of people served 		<ul style="list-style-type: none"> • Household occupant characteristics • Occupant needs addressed (% high priority) • Occupant satisfaction • Occupant benefits 		<ul style="list-style-type: none"> • Wx+H measures implemented • Wx+H services delivered • Wx+H delivery costs 	

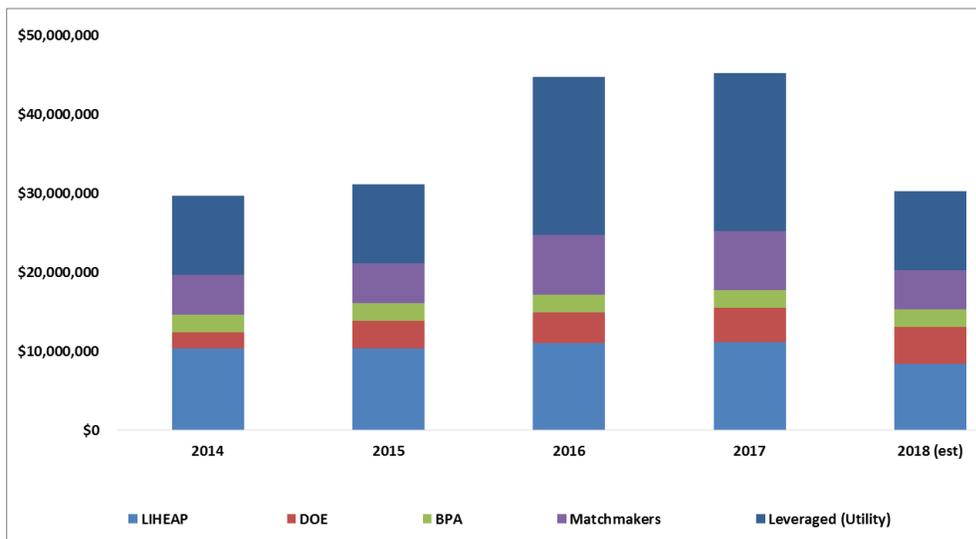
Background

Weatherization and Wx+H Program Funding

Wx+H is an initiative of Washington’s Weatherization Assistance Program. As illustrated in Figure 2, the Washington State Department of Commerce administers an annual combined weatherization budget of \$20 to \$45 million from four primary sources:

- U.S. Department of Health and Human Services Low-Income Home Energy Assistance Program (LIHEAP)
- U.S. Department of Energy Weatherization Assistance Program (WAP)
- Bonneville Power Administration (BPA): these funds are targeted to electrically heated homes
- Washington’s Matchmaker Program: funded through the capital budget with a requirement of 1:1 or greater state investment to leverage utility and other investments in low-income weatherization. It is generally the most flexible funding available to agencies.

Figure 2. Washington Low-Income Weatherization Program Budget by Fund Source and Fiscal Year



Most agencies also receive additional leveraged funding from local utilities, landlords (for multi-family), and housing and repair programs. Each of these funding sources is guided by separate policies and requirements governing eligibility, types of measures that can be installed, landlord commitments, and how much funding may be used for repair and health and safety measures. Commerce and grantees deliver most services using the rules and guidance of the DOE WAP program. DOE rules are the most restrictive and focus on energy efficiency and comprehensive home performance upgrades.

The Wx+H program was funded through the Matchmaker FY 2016-17 capital budget. The Legislature increased the Matchmaker allocation from \$10 million in FY 2014-15 to \$15 million in FY 2016-17. This provided a two-year window to pilot the Wx+H model. As discussed in the *Early Progress Report* (Schueler and Kunkle, 2016), Commerce elected to use a competitive process to identify and select pilot project participants. The selection and subsequent contracting process delayed roll out until late spring 2016, leaving most enhanced grantees with a 12- to 15-month window to deploy the program before the end of FY 2017 (June 2017).

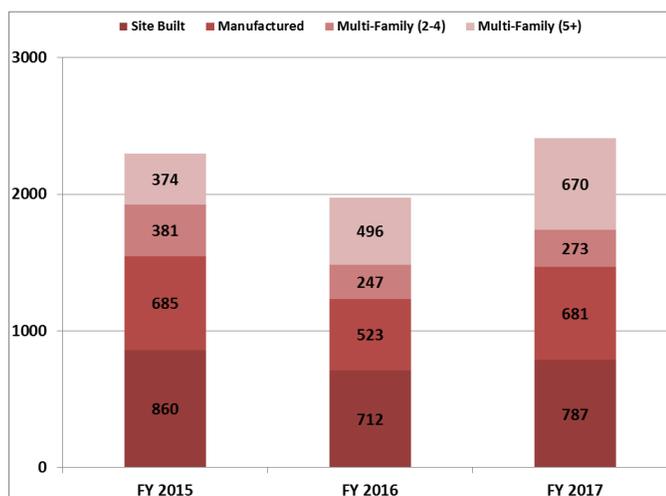
The Washington State Legislature failed to authorize the FY 2018-19 capital budget by June 2017 due to an impasse over water rights. The capital budget was passed in January 2018, followed by a supplemental capital budget in March 2018. The supplemental Matchmaker budget funded Wx+H at \$2.5 million for the remainder of biennium. The combination of a six-month gap in funding and the \$2.5 million drop in core funding for the biennium introduced uncertainty, slowed the program’s momentum, and shut down most new Wx+H service delivery by grantees between July 2017 and February 2018.

Commerce set aside approximately \$125,000 to allow grantees to finish follow-up visits to FY 2016-17 Wx+H clients and maintain some capacity. While helpful, amounts were very modest and contracts for expending this bridge funding were not in place until December 2017. According to grantees, these funds did little forestall the lost momentum.

Weatherization Production and Delivery FY 2015-17

As illustrated in Figure 3, statewide annual production of weatherized units for FY 2015-17, the period in which the Wx+H program was developed and operating, averaged about 2,200 units a year.⁵ Weatherization services were delivered by a network of 28 agencies including 19 nonprofit community action partnership agencies, six public agencies, and three tribal housing authorities. Each agency type had different rules, procedures, and flexibility concerning administering, hiring, contracting, and leveraging resources. Public agencies typically faced greater constraints and procedural barriers to contracting and hiring.⁶

Figure 3. Weatherization Production FY 2015-17



Most agencies conducted their own assessments and inspections, and contracted out weatherization services. One in five agencies relied on agency crews to install weatherization measures. Agencies ranged from very small, rural agencies with budgets under \$100,000 that completed a handful of single-family projects each year to large, urban agencies with budgets over \$2 million that completed hundreds of units and some large multi-family projects.

Enhanced Wx+H Design and Vision

The initial intention of the Enhanced Wx+H program was to help make the case that multi-faceted weatherization and HH interventions would have significant and measurable impacts on client medical costs. To that end, the Enhanced Wx+H grantees were encouraged to develop and deliver comprehensive services using a research-based design to:

⁵ Production in FY 2011-13 when ARRA funding was plentiful was between 3,000 and 5,000 units per year.

⁶ For example, public agencies typically cannot initiate any sub-contracting process until primary contracts are signed and in place. In one case, a county could not start Wx+H work until the contract was approved by the County Council.

- Target high-needs households with a focus on asthma and respiratory conditions. A focus on asthma was selected because there was a strong record of effective multi-faceted interventions for these households.
- Provide comprehensive weatherization and HH assessments.
- Provide asthma management and HH education services through community health workers (CHWs) and/or agency staff home visits. During home visits, low-cost measures such as green cleaning kits, dust mite covers, and HEPA vacuums would be provided.
- Deliver comprehensive weatherization and HH upgrades.
- Coordinate services with community partners including public health medical or mental health case management services.
- Leverage funding for additional repairs and HH measures.
- Provide three follow-up visits at 3, 6, and 12 months.

New HH Measures

In addition to providing comprehensive weatherization services, the Enhanced Wx+H program authorized a list of optional Wx+H measures that could be installed in homes where occupants had respiratory conditions (Table 1).

Table 1. Approved Enhanced Wx+H Measures

Lower-Cost Measures	Higher-Cost Measures
Wx+H client education	Pest mitigation
Green cleaning kit	Carpet removal – low VOC flooring
Dust mite covers (bedding)	Roofing
Walk-off door mats	Gutter and downspouts
Toxic household chemical removal	Plumbing leak repair
HEPA furnace filter	Sump pump and drainage systems
HEPA vacuum cleaner	Dehumidifiers
Air filter/purifier	Dehumidistat
Comprehensive cleaning (one time)	Mold abatement
<i>Water temperature adjustments</i>	<i>Crawlspace improvements</i>
<i>CO detector</i>	<i>Mechanical ventilation</i>
<i>Smoke detector</i>	<i>Advanced mechanical ventilation</i>

* Measures in blue italics can be installed with Wx funding.

All enhanced grantees had the option of providing any of the measures and services on the approved list. Expenditures for higher-cost measures were capped at \$4,000. The \$4,000 cap could be lifted on written approval from Commerce. Program policy also encouraged agencies to use weatherization funding first for measures that could be installed with weatherization funding.

Leveraging Resources from Public Health and the Medicaid Program

A key design intention for Enhanced Wx+H grants was that agencies would leverage resources and support from the medical and public health sectors. Three of eight enhanced grantees worked with public health or medical clinics to deliver home visit services. The remaining grantees included community health partners for consultation and referrals, but provided all program services (weatherization, HH, and home visits/education) in-house through the weatherization program staff.

The funding landscape for public health was challenging during grant period. FY 2015-17 saw erosion in federal, state, and local funding for public health initiatives in general, and erosion of funding targeting asthma and respiratory services in particular in Washington.

The long-term intention for Wx+H was to develop integrated service models that could eventually become eligible for Medicaid reimbursement. One of the pathways for doing this was by working through Washington's Medicaid Transformation (1115 Waiver) program, Healthier Washington, which included a specific focus on integrated community-based programs and working in the nexus between health and housing.

All grantees were encouraged to participate in the Medicaid Transformation waiver process, led by local coalitions of health providers and community organizations (referred to as Accountable Communities of Health, or ACH). ACH are intended to encourage integrated and coordinated community services delivery to reduce Medicaid and healthcare use at the local level.

A True Pilot Project

Commerce also made the explicit decision to operate the enhanced program as a pilot project. Agencies were encouraged to innovate, experiment, and develop their own local approaches to deliver the model elements outlined above. This was done to maximize learning, provide flexibility, accommodate the pre-existing assessment and education tools and practices of medical and public health partners, and accommodate local contracting and staffing constraints and capacity. There was not enough time to standardize methods and approaches among grantees prior to rolling out the program (Schueler and Kunkle, 2016).

The Enhanced Wx+H demonstration also required grantees to make major changes in agency practice, culture, and process. These changes included:

- **A semi-competitive grant process and non-standard delivery:** The Enhanced Wx+H grant was only the second time Commerce funds were awarded to weatherization agencies by application rather than allocation formula.⁷ The ongoing weatherization program follows the guidance provided in a hefty manual and requires adherence to detailed standard work specifications and reporting requirements. Enhanced Wx+H grantees were given significant flexibility to design and deliver Wx+H services within broad parameters. However, this flexibility did not apply to weatherization services funded by BPA, DOE, or LIHEAP.
- **New relationships**, including partnerships with medical and public health providers; engagement with community-based ACH; and deeper, more intensive client engagement in new areas (health in addition to energy efficiency).
- **New measures**, including HH measures (advanced ventilation, flooring, pest management, and cleaning), expanded education, and low-cost measures (green cleaning kits and HEPA vacuums).
- **New contractors** for flooring, cleaning services, plumbing, and sump pumps.
- **New clients**, including those with high health needs. Four of the grantees had worked with or had partners who worked with children with asthma. Three grantees (PCHS, KCHA, and OPPCO)

⁷ A small amount of ARRA funding was awarded by application six years prior to Wx+H.

expanded their client base to include older adults and those with COPD and other respiratory conditions.

- **Weatherization agencies** had to develop new procedures, which included:
 - Seeking and targeting households with high health needs,
 - Providing comprehensive case management services and health referrals rather than focusing education primarily on energy use, and
 - Providing weatherization and upgrade services for homes that would previously have been deferred because of repair or other needs.

Enhanced Grantee Project Summaries

In the September 2015, Commerce released a competitive RFA for the Enhanced Wx+H pilot. Twelve agencies applied. Six agencies were awarded grants in February and March 2016. One agency (KCHA) that just missed the application deadline was allowed to convert its Basic Wx+H allocation to an Enhanced Grant. Two agencies that applied but were not selected for funding were subsequently given small startup grants. The eight grantees are described in Table 2. A detailed profile of each grantee is provided in Attachment 3.

The eight grantees or their partners brought significant experience to delivering HH services to clients:

- Two of the eight grantees (OPPCO and KCHA) participated in national pilot studies to test the model.
- Two grantees (YVFWC and PCHS) worked with established asthma home visit programs.
- Three of the remaining grantees had some experience offering HH services in more limited settings.

Large urban agencies were also more likely to apply and be awarded enhanced grants. Four of Washington's five (80%) large urban agencies participated compared to 15% of small urban, tribal, and rural weatherization agencies. The Enhanced Wx+H grantees that applied for and were awarded grants were more likely to have capacity to be successful at starting up and delivering complex program services than non-grantees.

Table 2. Summary of Enhanced Wx+H Grants

Grantee Funded Partner	Grant Type	Grant Amount	Upgrade Targets		Education – Outreach Model	County Served	Agency Type
			Compre- hensive	Education Low Cost			
The Opportunity Council (OPPCO)	Full	\$478,000	40	10	Referral	Whatcom, Island	CAP/NP Small Urban
Pierce County Human Services (PCHS) (Tacoma Pierce County Health Dept.)	Full	\$408,042	40	35	CHW Partnership	Pierce (not Tacoma)	Public Large Urban
Yakima Valley Farm Workers Clinic (YVFWC)	Full	\$362,955	37	113	CHW Partnership	South Yakima	CAP/NP Large Rural
Spokane Neighborhood Action Partners (SNAP)	Full	\$218,082	28	22	Referral	Spokane	CAP/NP Large Urban
Snohomish County Human Services (SCHS)	Full	\$137,500	18	17	Referral	Snohomish	Public Large Urban
King County Housing Authority (KCHA) (Seattle King County Public Health)	Convert	\$277,233	30	150	CHW Partnership	King (not Seattle)	Public Large Urban
Blue Mountain Action Council (BMAC)	Start Up	\$53,000	5		Referral	Walla Walla	CAP/NP Small Rural
Yakama Nation Housing Authority (YNHA)	Start Up	\$50,000	7		CHW Partnership (Proposed)	Yakama Nation	Tribal
Total		\$1,984,812	205	347			

CAP = community action partnership

NP = nonprofit

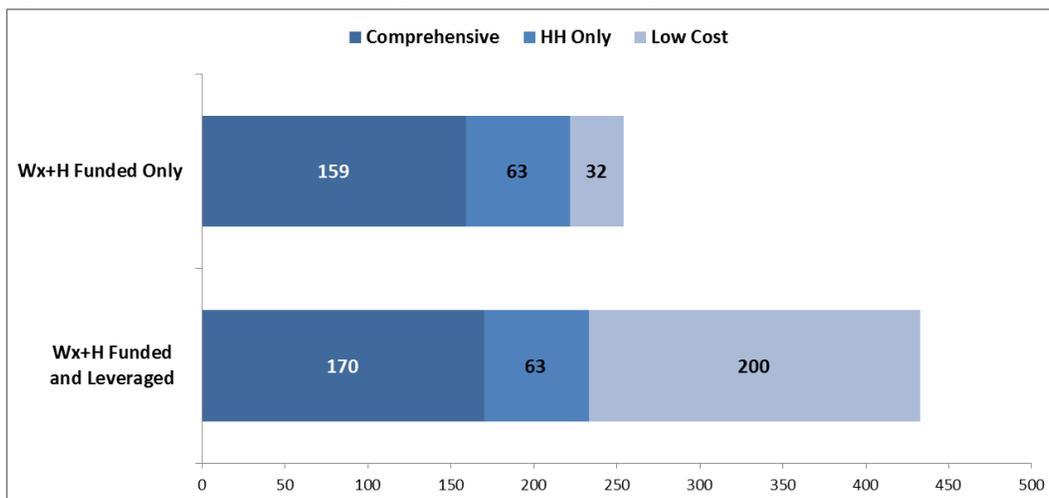
The Enhanced Wx+H Grant

Enhanced Grant Outcomes

Enhanced Wx+H grants were used to fund measures installed in 254 homes. An additional 211 homes received services fully paid for by community partners or other Commerce grants. As shown in Figure 4, Wx+H-funded installations are categorized as follows:

- **Comprehensive:** Households receiving a package of weatherization and HH measures. All projects received initial in-home assessments and all are scheduled to receive one or more follow-up visits.
- **HH Only:** Only HH measures were installed because the home had been previously weatherized or did not need weatherization measures, or because weatherization services could not be completed in the grant period. Households received home visits and follow-up visits. Most HH-only projects were under the Enhanced Wx+H cost cap of \$4,000. This category excludes projects with low-cost HH measure packages under \$1,000.
- **Low-cost HH:** Includes HH packages under \$1,000 (most are under \$500). Typical low-cost HH recipients received initial assessments and home visits, but were screened out or dropped out before receiving comprehensive weatherization and HH measure packages. These households did not receive post-installation follow-up visits through the Wx+H grant.

Figure 4. Total Households Receiving Wx+H Paid or Leveraged Services



Most Wx+H-funded measures were comprehensive or HH-only installations. Most leveraged projects were in the low-cost categories. Figures 5 and 6 summarize data by grantee. Most grantees completed projects with leveraged funding. Projects with strong community partners offering home visit services provided most leverage projects.

Grantees Met Targets for Installing HH Measures

As part of the initial grant application process, grantees set targets for the number of households receiving comprehensive upgrades, less-intensive education, and low-cost measures. Most enhanced grantees met or exceeded targets for completing projects with installed HH measures (Table 3).

Figure 5. Wx+H Funded Installations by Grantee and Installation Category

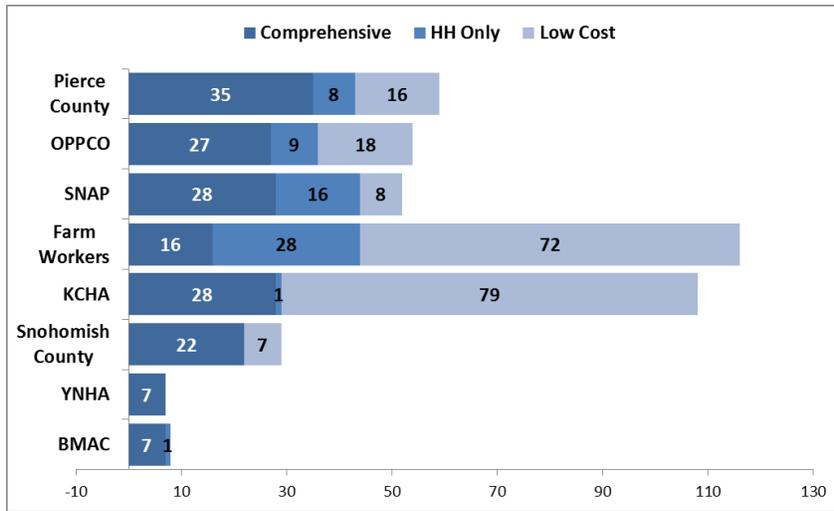


Figure 6. Wx+H Funded and Leveraged Installations by Project Type and Grantee

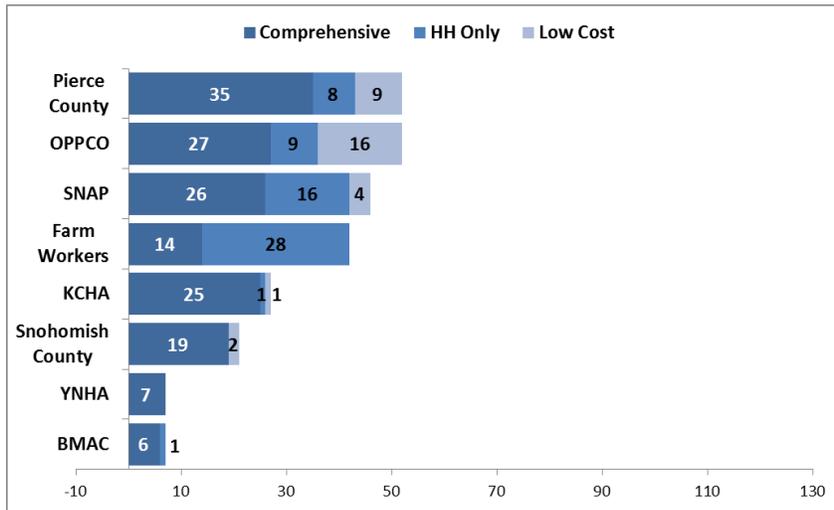


Table 3. Performance against Projected Production by Enhanced Grantees

	Comprehensive + HH only		Education, Low Cost	
	Actual	Target	Actual	Target
Exceeded Targets				
All Grantees	222	205	209	347
Opportunity Council	36	40	18	10
King County Housing Authority	26	30	82	150
Pierce County Human Services	43	40	16	35
Spokane Neighborhood Action Partners	42	28	8	22
Yakima Valley Farm Workers	42	37	72	113
Snohomish Human Services	19	18	7	17
Yakama Nation Housing Authority	7	7	0	
Blue Mountain Action Council	7	5	1	

Grantees did not meet initial targets for education and low-cost measures for two reasons:

1. Most (81%) low-cost and education-only services were provided by the three agencies that partnered with organizations that provide CHW visits. These agencies hit 50% to 60% of their targets. Actual completions were under or partially reported because the WSU Energy Program was not able to establish direct reporting arrangements with community partners due to constraints on accessing data in protected clinic or public health settings.
2. Agencies that did establish CHW partnerships focused on completing comprehensive projects.

As shown in Figure 7, most Wx+H projects were completed in the last two quarters of the grant period. This lagging implementation is consistent with most pilot projects. The first nine months of the biennium were devoted to establishing contracts with agencies, which in turn needed six to nine months to develop additional subcontracts with community partners or with contractors willing to install Wx+H measures.

Most Wx+H measures were installed by June 30, 2017. Projects that closed after June 2017 included those where installation or inspection of weatherization measures was delayed. The cumulative total does not add up to 254 because final inspection dates were not reported for all low-cost projects and a few comprehensive projects were still waiting on final inspection.

Lesson Learned

All agencies were able to meet and in some cases exceed their targets for completing comprehensive upgrades. This required significant efforts, often compressed into a few months of the grant. Much of this delay was driven by contracting issues, discussed in more detail later in the report. All grantees noted that it was very difficult to establish and maintain capacity to deliver these services when resources and funding for the work was only available in a time-limited window.

Recommendation

To allow sustained effort over time, Wx+H services should be integrated into existing services rather than offered as a stand-alone program. Given uncertainty in any individual funding stream, Commerce should allow other funding sources, such as LIHEAP, to be used for Wx+H measures to the extent permissible under the rules governing these funding sources.

Did Agencies Deliver on the Enhanced Wx+H Vision?

All eight enhanced grantees were effective at installing the physical measures. They were less effective at delivering HH assessments, home visits, and service integration features that are considered essential parts of multi-faceted HH interventions. The initial Wx+H RFA and supporting research identified six elements of multifaceted HH interventions that were associated with high-performing programs that delivered strong health outcomes.

Table 4 is a qualitative summary of the degree to which the grantees delivered on the six elements of the Wx+H Enhanced Grant service model. The darker shades of red indicate that the grantee was closer to the initial vision specified in the RFA. All eight grantees delivered on parts of the model, but no grantee delivered on the full model. Tasks involving integrating and coordinating services with public health, medical providers, or other community partners were the most challenging for grantees to address.

Figure 7. Most Units Were Completed in the Last Quarter of the Grant

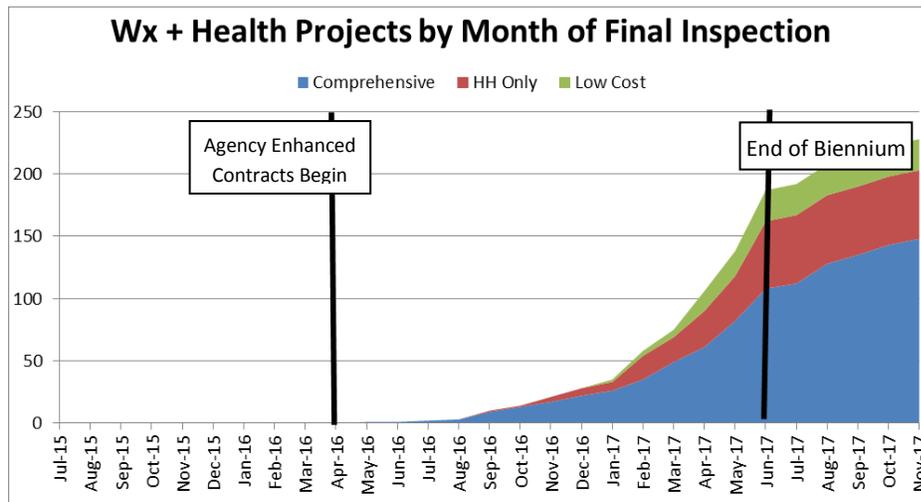


Table 4. Qualitative Assessment of Grantee Achievement of Enhanced Wx+H Design Principles

Grantee	Targeting High Need Households	Wx and HH Assessment	Home Visits by CHW	Comprehensive Upgrades	One-stop Service Coordination	Leverage Resources
OPPCO	High	Med	Low	Med	Low	Low
Pierce County	High	High	High	Med	High	Low
YVFWC	High	Med	High	Low	Low	Low
SNAP	Med	Med	Med	Med	Med	Low
Snohomish County	Low	Low	Low	Med	Low	Low
KCHA	Med	Med	High	Med	Low	Low
BMAC	Low	Low	Low	Med	Low	Low
YNHA	Med	Low	Low	Med	Low	Low

Targeting High-Need Households

Were households with high needs/high medical service use explicitly targeted? Agencies demonstrating low achievement of stated program goals documented that one or more people in the household had asthma or respiratory health issues. Agencies demonstrating high achievement had specific strategies and mechanisms to seek referrals for high-use households, or obtained referrals from the medical community for people with poorly controlled health conditions that were consistently applied to all or most clients. Agencies demonstrating medium achievement of the stated goals accepted referrals or targeted high-need households in some cases.

Comprehensive Assessment

Was there a structured, comprehensive, HH assessment that resulted in a client action plan that addressed weatherization needs, medication management, and referrals for co-morbid conditions and environmental triggers? High-achievement assessments addressed all three areas; low-achievement assessments addressed only one area.

Community Health Worker Home Visits

Did a certified CHW with medical training provide up to six home visits? High-achievement agencies provided home visits by a certified CHW or other person with medical training. Medium-achievement

agencies used internal staff who received some CHW training. Low-achievement agencies relied on weatherization staff who had limited training in HH essentials.

Comprehensive Upgrades

What percentage of projects received comprehensive weatherization and HH upgrades? All grantees indicated that contracting and other issues left major HH measures incomplete for some households so no grantee is considered high achievement. YVFWC had a high share of homes that received HH measures and less comprehensive weatherization services. A key driver of this was the high number of referrals relative to the availability of weatherization funds from other sources.⁸

One-Stop Service Coordination

Was there a process to coordinate services with other community partners at a household level? Did those providing home visits provide referrals and link clients to other community resources available to address other household health and social service needs? Did the staff conducting home visits and energy assessments consult on or deliver a service plan? High achievement agencies had a focus on comprehensive health and social services and need partners met to develop a coordinated strategy. Medium achievement agencies had more informal strategies.

Leveraged Resources

Were additional resources for HH and repair costs leveraged from other agencies and partners? The five agencies that did not have partnerships with entities that provided medical home visits were not able to provide comprehensive education to address medical needs, manage medications, or provide referrals to address other emergent social service needs. Agencies without these partnerships focused primarily on installing additional measures and generally did not have a structured curriculum to address environmental triggers, encourage behavior change, or address other health conditions or social service needs.

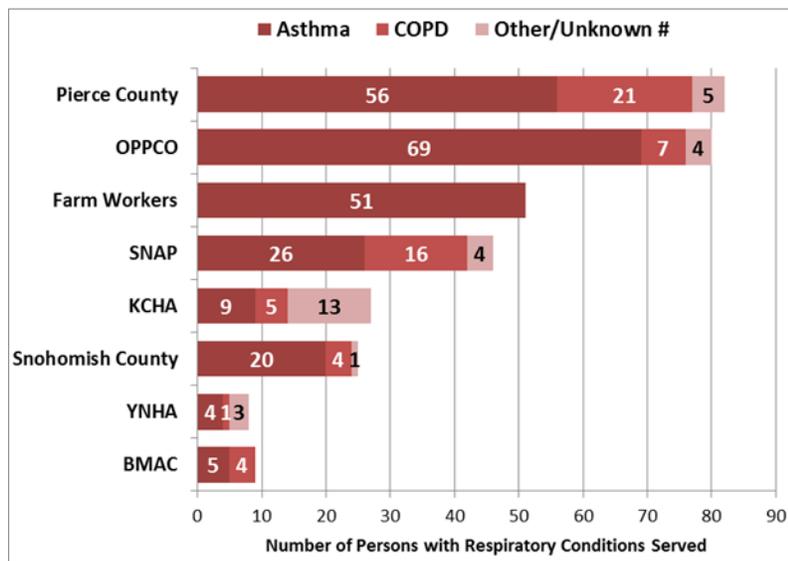
Serving Households that Included People with Respiratory Conditions

The original intention of the grant was to provide comprehensive services to households that included people with asthma. This was later broadened to include anyone with respiratory disease. All grantees documented that households receiving Wx+H services had at least one member with a respiratory health condition. The incidence of households with COPD or other non-asthma health conditions was higher than initially expected.

- All 254 households receiving Enhanced Wx+H measures had at least one person with a documented respiratory condition. Of 757 people residing in homes receiving enhanced measures, 332 (43%), or 1.3 people per household, had a documented respiratory condition; 54 households (20%) had two or more people with respiratory conditions.
- Of 332 people with respiratory conditions, 71% were referred for asthma, 21% for COPD, and 14% for other conditions. With the exception of the YVFWC, which focused exclusively on patients with poorly controlled asthma, all projects served clients with COPD and other respiratory conditions (Figure 8).

⁸ YVFWC established targets and delivery model under the assumption that Wx+H could be used for both weatherization and HH measures.

Figure 8. Enhanced Occupants with Respiratory Conditions by Referral Condition



Households Similar to Single-Family Households Receiving Low-Income Wx Services

Only three of the eight enhanced grantees targeted high-need occupants. To install projects by the June 2017 end of the grant, most agencies focused on providing services to existing weatherization and energy assistance clients. The higher reliance on existing clients resulted – not surprisingly – in a client profile that was similar to the client profile for all LI Wx participants, in that they were older and owned their single-family home. About a third of people referred for Wx+H services were under 18 years of age (37%), a third (31%) were 18 to 60 years, and a third (32%) were over 60 years of age (Figure 9). Older occupants were more likely to have respiratory conditions other than asthma.

A total of 4% of homes receiving Wx+H measures were multi-family units, compared to 37% of the low-income units weatherized in the state over the same time period (Table 5). Enhanced grantees did not recruit multi-family units for the program because of the requirement that weatherization services be provided to all units of building and not just specific units occupied by people with health conditions.⁹ A handful of multi-family units received additional HH measures after they had completed weatherization through normal program channels.

As indicated in Table 6, 8% of Wx+H units treated were renter-occupied. Renter-occupied units comprise 70% of households under 125% of the Federal Poverty Level in Washington¹⁰ and 35% of low-income units weatherized statewide in FY 2016-17. Rental units are less likely to receive weatherization services than owner-occupied units because rental units are harder to qualify and progress through the application process.¹¹

⁹ Commerce’s initial guidance on the program also discouraged standalone education and low-cost interventions for multi-family units to focus resources on testing the feasibility of the multi-faceted intervention model.

¹⁰ WSU Energy Program, Low-Income Weatherization Program Needs Assessment: Preliminary Statewide Results (December 2012).

¹¹ In addition to general skepticism of government and a concern that participants would be admitting to providing sub-standard housing, the weatherization agreement requires a landlord contribution in the form of a financial commitment, an extended rent freeze, or covenants to keep the unit as low-income housing for at least five years.

Figure 9. Age of People Referred for Enhanced Wx+H Services

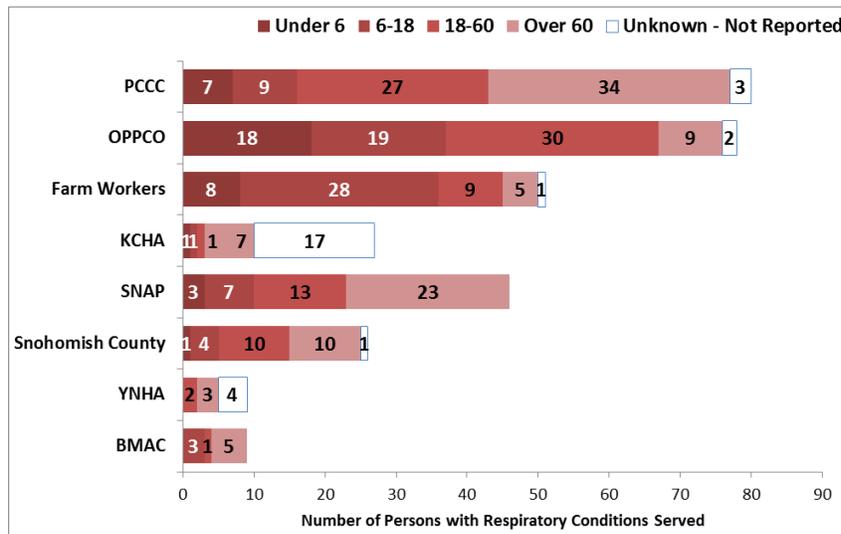


Table 5. Building Type: Wx+H Units Compared to All Weatherized Units

	Wx+H Units (n=254)	Units Weatherized Statewide FY 2016-17 (n=2411)
Building Type		
Single family – stick built	54%	35%
Single family – manufactured	42%	28%
Multi-family – 2 to 4 units	2%	13%
Multi-family – 5+ units	2%	24%

Table 6. Selected Occupant Characteristics: Wx+H Units Compared to All Weatherized Units

	Wx+H Households	Units Weatherized Statewide FY 2016-17
Renter Occupied (%)	8%	35%
Age – one or more over 60 years	36%	35%
One person with a disability	30%	21%
Income Eligibility (% FPL)		
Under 100%	40%	52%
101% - 125%	23%	26%
Over 125% of FPL	37%	22%

The pressure to meet fairly tight production deadlines further discouraged project work with landlords. Six of eight grantees explicitly screened out renter-occupied units during the referral process. Others such as Tacoma-Pierce County Public Health initially referred clients in rental units to the weatherization agency but were not successful in getting them through the application process.

Because owner occupancy is linked to higher incomes, Wx+H households were more likely be at the higher end of the low-income qualification scale (125% to 200%+ of the Federal Poverty Level) (Table 6). Over a third (36%) of Wx+H households had an elder, 60 years of age or older, residing in the home. This is similar to households receiving weatherization services. Wx+H households were more likely than other homes receiving weatherization services to have a person with a disability living in the home (30% vs. 21%).

Compared to all single-family weatherized homes statewide, homes receiving Wx+H measures were:

- More likely to use electric space heat as the primary heating source (69% vs. 59%);
- Less likely to use other heating fuels such as oil, propane, or wood (7% vs. 13%); and
- Usually built after 1990 (19% vs. 11%).

These differences largely reflect the greater share of manufactured homes in Enhanced Wx+H projects.

Lesson Learned

The characteristics of homes receiving Wx+H services are similar to the statewide characteristics of single-family homes receiving low-income weatherization services, which tend toward older occupants in owner-occupied, single-family units.

Recommendation

It is difficult to align comprehensive Wx+H services with serving households in rental and multi-family units where it is likely that many high-needs households reside.

- A low-cost option for home visit measures targeted to the occupants (cleaning kits, vacuums, bedding) that would not require landlord engagement could be developed.
- If agencies offer this model, the agency proposal should be reviewed and approved on a case-by-case basis.

Condition of Homes Receiving Wx+H Measures

The LI Weatherization Program places fairly tight limits on what can be spent for repair, which is largely limited to repairs required to protect the integrity of weatherization measures. Additional limits on what can be spent for health and safety measures are imposed by weatherization program funders. Consequently, agencies report they walk away from or defer between 40% and 60% of the projects that would otherwise be eligible for weatherization.¹² Typical deferral issues include plumbing leaks, electrical issues, vermiculite and asbestos, roof repairs, clutter or hoarding, and pets. While the Wx+H enhanced grant allowed for additional repair and health and safety measures, new funding was modest and Commerce approval was required for investments over \$4,000 per home. A few grantees reported that Wx+H funding did encourage them to consider homes and projects that they would otherwise defer.

As part of participant reporting, grantees were asked to summarize household hazard data captured during home visits. Agencies rated whether there were no, minor, moderate, and major concerns in 12 areas using a version of the PSS (Table 7). Because different scoring strategies were used by agencies to rate home conditions, the data is not precise or definitive. Broad observations include:

- The most common concerns identified were excess moisture and ventilation followed by cleaning and general household condition. Agencies reported that mold was less of an issue than expected, with only 12% of homes being assessed reporting it as a major concern (more than two surfaces having visible mold covering two square feet).

¹² Washington State University Energy Program (December 2012). Low-Income Weatherization Program Needs Assessment: Preliminary Statewide Results. And Washington State University Energy Program (March 2018). Rural Housing Rehabilitation Program Needs Assessment.

- Homes receiving HH only and low-cost measures had somewhat poorer ratings for many hazard factors. Many homes receiving low-cost and limited HH measures were deferred from weatherization. Agencies provided lower-cost measures and home visits as an alternative.
- The hazard assessment, which focused on excessive heat or cold at the time of assessment, did not effectively capture whether the home would benefit from insulation and weatherization. Only 15 households receiving comprehensive services were identified as experiencing excess heat and cold. However, 132 of 154 homes receiving comprehensive services required multiple insulation and shell measures.
- Agencies generally steered clear of homes with high HH or repair needs. Only 19% of all projects (22% of single-family homes) were high-needs homes, defined as having three or more household hazard factors rated as a major concern in the PSS. Thus, the household hazard and condition data reported here generally reflects the condition of homes that are successfully weatherized and NOT the condition or concerns found in lower-income homes in general, or in homes of lower-income households where members have asthma or respiratory conditions.

Table 7. Household Hazards Reported by Type of Wx+H Upgrade

	Comprehensive (152)		HH Only (62)		Low Cost (27)	
	Any Mention	Moderate - Major	Any Mention	Moderate - Major	Any Mention	Moderate-Major
Excess moisture	103 (68%)	57 (38%)	52 (84%)	36 (58%)	22 (81%)	12 (44%)
Ventilation	98 (64%)	48 (32%)	45 (73%)	21 (34%)	19 (70%)	6 (22%)
Pets	87 (57%)	28 (18%)	18 (29%)	7 (11%)	12 (44%)	4 (15%)
Cleaning/clutter	83 (55%)	41 (27%)	38 (61%)	21 (34%)	22 (81%)	12 (44%)
Presence of mold	81 (53%)	26 (17%)	39 (63%)	14 (23%)	23 (85%)	7 (16%)
Toxins - pesticides	69 (45%)	25 (16%)	23 (37%)	7 (11%)	9 (33%)	1 (4%)
Structural	53 (35%)	22 (14%)	14 (23%)	9 (15%)	12 (44%)	4 (15%)
Excess heat/cold	44 (29%)	15 (10%)	22 (35%)	6 (10%)	11 (41%)	0 (0%)
Fall hazards	44 (29%)	11 (7%)	13 (21%)	3 (5%)	9 (33%)	3 (11%)
Fire hazards	40 (26%)	12 (8%)	16 (26%)	11 (18%)	7 (26%)	2 (7%)
Combustion vent	38 (25%)	13 (9%)	8 (13%)	4 (6%)	5 (19%)	1 (4%)
Electrical hazards	29 (19%)	3 (2%)	5 (8%)	4 (6%)	4 (15%)	2 (7%)
Other	20 (13%)	5 (3%)	4 (6%)	1 (2%)	7 (26%)	1 (4%)

Wx+H Services and Measures Provided

Enhanced Wx+H grantees installed both HH and weatherization measures in homes.¹³ Table 8 summarizes HH measures:

- Most Enhanced Wx+H homes received a package of low-cost measures, including a green cleaning kit, dust mite covers, walk-off mats, and a HEPA vacuum.
- There was wide variation in installation of higher-cost HH measures among grantees, reflecting locally available contracting infrastructure. Of the higher-cost measures, the most commonly installed measure was carpet removal and replacement with low-VOC flooring. This measure was installed in 32% of comprehensive projects and 52% of HH-only projects. Other higher-cost

¹³ Some measures, such as mechanical ventilation, CO detectors, and smoke detectors, could be installed under either program. To simplify, measures common to both programs are reported with HH measures.

measures, such as advanced ventilation, plumbing repairs, roof replacement, pest mitigation, and mold and moisture abatement, were installed in 10% to 20% of comprehensive projects.

Table 8. HH Measure Installations by Wx+H Project Type

	All Wx+H	Comprehensive	HH Only	Low-Cost HH
Total Households	254	159	63	32
Green cleaning kit	94%	94%	92%	94%
Bedding (dust mite)	70%	71%	71%	66%
Mechanical ventilation	65%	89%	37%	3%
HEPA vacuum	65%	67%	59%	66%
Walk-off mats	64%	61%	68%	72%
CO detector	57%	74%	44%	3%
Low VOC flooring	33%	32%	52%	
Smoke detector	24%	33%	13%	3%
Advanced ventilation	17%	19%	22%	
HEPA/MEPA filter	17%	19%	17%	3%
HVAC cleaning	17%	16%	27%	
Air filter	15%	19%	8%	6%
Plumbing repair	13%	18%	8%	
Gutter, downspout	13%	16%	11%	
Moisture mold abatement	13%	15%	13%	
Roof repair/replace	11%	14%	8%	
Pest mitigation	9%	11%	10%	
Comprehensive cleaning	8%	8%	13%	
Crawlspace	7%	11%	2%	
Slip/fall prevention	5%	7%	2%	
Dehumidifier	2%	3%		3%

Strong evidence from data and grantee interviews suggests that Wx+H measures were “rationed.” Most projects had one or more measure that was not done or was scaled back to fit within the Commerce spending caps and meet production goals.

- The combination of limited funding and the high cost of some interventions significantly impacted the breadth of HH upgrades. Most comprehensive upgrades had only one or two major HH measures funded with Wx+H dollars. Most grantees indicated they managed Wx+H installations within Commerce’s \$4,000 “soft” cap to avoid delays in the review process and to ensure there were sufficient funds to meet targets. Agencies reported that even without the caps, Wx+H funding was not sufficient to address all needs in many homes.
- In some of the higher-cost agencies, a single measure such as carpet replacement could exhaust most of the Wx+H allocation. Agencies also managed against the cap by scaling back on measures.¹⁴
- Agencies also indicated they were less likely to experiment with more complex measures, such as advanced ventilation, or to provide services for homes with mold. Agencies also reported that did not include higher-cost enhanced measures in some projects because installer subcontracts

¹⁴ One common strategy was to limit carpet removal/flooring installation to the bedroom of the person with a respiratory condition.

for some new Wx+H measures were either delayed or simply not put out to bid before the initial grant award ended.

Weatherization Measures

As shown in Table 9, the 159 comprehensive Wx+H clients received a full weatherization package.¹⁵ Wx+H weatherization packages were more likely to include higher-cost measures. In Wx+H projects:

- Lighting was less likely (71% vs. 46%),
- Wall insulation was less likely (37% vs. 17%),
- Windows were more likely (14% vs. 24%), and
- HVAC replacement was more likely (34% vs. 46%).

These differences appeared to be driven by weatherization practices of the Wx+H grantee pool (Wx+H grantees were more likely to install these measures in all of their weatherized units). There is little evidence to suggest that the Wx+H assessment process influenced what weatherization measures were installed.

Weatherization measure data does not address whether similar measures installed in Wx+H projects were more intensive than those installed in typical weatherization projects. For example, 89% of Wx+H comprehensive projects and 90% of all weatherization projects had mechanical ventilation installed because it is required by building code. Wx+H funding was used in some situations to move beyond minimum code standards to include additional mechanical ventilation or advanced ventilation methods (19% of comprehensive Wx+H projects reported both mechanical and advanced ventilation measures were installed).

Table 9. Profile of Weatherization Measure Installations by Wx+H Project Type

	All Wx+H	Comprehensive	HH Only	Low-Cost HH
Total Households	254	159	63	32
Air sealing	69%	92%	43%	9%
Attic insulation	48%	75%		3%
Water heat, low cost	46%	72%	5%	
Passive venting	41%	60%	10%	3%
Floor insulation	39%	62%		3%
HVAC – replace	30%	46%	3%	
Lighting	30%	46%	3%	
Duct sealing	28%	43%	6%	
Furnace tune and clean	20%	32%		
Duct insulation	19%	30%		
Door	16%	26%		
Windows	15%	24%		
Thermostat	13%	20%		
HVAC – repair	11%	17%	2%	
Electrical repair	11%	18%		
Wall insulation	11%	17%		
Duct repair	10%	16%		
Water heater	10%	16%		
Wx repair	1%	2%		

¹⁵ Homes that received air sealing and low-cost weatherization measures in addition to HH measures were classified as HH-only projects.

Typical Single-Family Wx+H Installations

Single-family homes receiving comprehensive Wx+H services clustered into four categories by building type and home condition. Four common project types are summarized below and are illustrated by project case studies (Attachment 2).

Profiles of Four Common Single-Family Wx+H Installations

1. Stick-built homes in good or adequate condition that require weatherization (41%)
 - Homes are fairly well maintained but have not been weatherized. HH measures focus on ventilation and/or spot carpet removal.
 - IMCs \$5-25,000 (average \$12,000). Higher costs due to comprehensive weatherization and/or delivery by an agency with high contracting costs.
 - [The Osborne case study](#)
2. Manufactured home in good or adequate condition (35%)
 - Typically these are maintained units requiring weatherization and more modest measures to address health concerns (carpet removal, improved mechanical ventilation).
 - More likely to have elderly occupants with COPD.
 - [The King and Shaw case studies](#)
3. Stick-built homes in poor physical condition requiring significant repair or HH interventions (11%)
 - IMCs \$15,000 to \$44,000 (average \$23,000)
 - Typically require roof or structural repairs, have wood stoves and plumbing issues, or special issues such as asbestos or vermiculite remediation.
 - Homes more likely to include multiple people with respiratory conditions.
 - [The Finkbonner case study](#)
4. Manufactured homes in poor physical condition (13%)
 - IMCs \$10-40,000 (average \$22,000)
 - Often involve roof repairs, heating system replacement, mold remediation, and plumbing issues
 - Often older, pre-1990 manufactured homes
 - [The Garzus – Lemus case study](#)

Across these common project types:

- Roughly half of completed installations were stick built and half were manufactured homes.
- One out of five homes receiving services were in poor physical condition and required significant HH or repair interventions.

Lesson Learned

The Wx+H program primarily served weatherizable homes that were in need of fairly modest additional interventions. Most Wx+H installations received weatherization and a set of lower-cost Wx+H measures. A smaller number of high-intervention homes were treated. Costs were typically two to four times the average and median costs for weatherization. Strong evidence from data and grantee interviews indicates that Wx+H measures were rationed. Most projects had one or more measure that was not done or was scaled back to fit within the Commerce spending caps.

Recommendations

FY 2018-19 Matchmaker funding is not sufficient to address high-need/high-cost households as a general practice. Given limited funding, there is a need to place caps on Wx+H expenditures. Some additional flexibility with Wx+H spending, in the form of increasing the cap or allowing agencies to manage Wx+H to an average cost per unit, would be beneficial. Commerce may want to consider allowing additional funds to be expended in cases with exceptional need (for example, multiple people with medical vulnerabilities or other emergent needs in a household).

Contracting and Measure Installation

All grantees reported they needed to establish new contracts for installing Enhanced Wx+H measures because existing weatherization contractors were not interested in installing more specialized Wx+H measures or did not have the capacity to do so. It was also challenging to draw in new contractors since funding was modest and could not be assured over the long term.

Seven of the eight grantees indicated internal administrative rules required a signed contract with Commerce before they could begin contracting for enhanced services. The serial nature of contracting delayed the availability of contracted services for enhanced measures until the last two quarters of the grant.

A difficult contracting situation was further complicated by the state's Prevailing Wage Standards, which impose complex reporting requirements as a condition of all low-income weatherization contracting. Prevailing wage requirements significantly delayed local agencies in securing contractor capacity needed to install Enhanced Wx+H measures. Previous analyses of prevailing wage requirements as they pertain to residential weatherization have found that the major costs drivers are not increased wages but, rather, the administrative and reporting requirements that are attached to these rules, which treat a \$3,000 weatherization project the same as \$30 million highway project.¹⁶

All grantees reported they limited or delayed offering the following eligible Wx+H measures because of challenges in finding contractors or delays in getting them on board:

- Low-VOC flooring – in rural areas it was challenging to find local suppliers
- Pest mitigation
- Gutters and downspouts
- Plumbing repair

Six of the eight grantees did not offer the measures listed below because they were not able to secure contractor capacity:

- Roofing
- Advanced mechanical ventilation
- Sump pumps and drainage
- Mold abatement

Grantees also faced challenges in securing low-cost measures including green cleaning kits, dust mite covers, walk-off mats, HEPA vacuum cleaners, and furnace filters. Because these were new measures and materials for procurement processes, any bulk purchases required developing specifications and

¹⁶ WSU Energy Program, 2014

putting the measure out for bids. Even when bulk purchases were made, agencies that did not have crews faced simple but challenging barriers like finding places to store materials. One grantee attempting to put together a green cleaning kit found it easier to buy materials at the local warehouse store and assemble the kits themselves.

Recommendations

Agencies and their partners need additional information, resources, and support to identify products and contractors. Commerce should explore the possibility of statewide contracts for hard-to-find services. Commerce and local agencies have identified prevailing wage reporting requirements as a significant driver of contracting costs and an impediment to securing a diverse, cost-competitive contractor network in a timely manner.¹⁷ Commerce and local weatherization agencies should pursue relief from prevailing wage reporting requirements.

Total Cost of Installed Measures

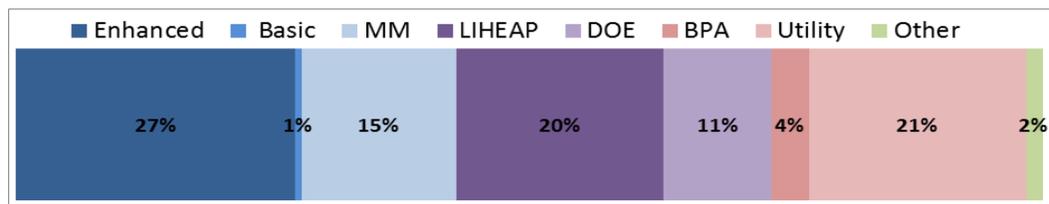
A total of \$723,000 (36%) of the \$1.98 million Enhanced Wx+H grant funds passed through to local agencies went toward IMCs. The remainder of the grant was used for outreach, education, assessments, home visits, program development, and administration. The share of funding going to support costs (65%) is generally consistent with support costs expected for start-up and pilot projects.¹⁸ The full cost and benefits for Wx+H will be assessed in the final report of this series.

The remaining cost data in this report is focused on IMC. Total IMC, which include costs for energy efficiency upgrades, weatherization-related repairs, and needed health and safety measures along with WX+H measures, provides a good proxy for the comprehensiveness of the upgrade.

Funding Sources and Leverage

The total installed measures costs for Wx+H projects were \$2.7 million. Enhanced Wx+H grant measure funds (\$723,000) leveraged \$2.02 million in additional direct measure costs from other weatherization program funders (Figure 10). This included an additional \$17,000 or 1% of IMC, allocated to the Basic Wx+H program and \$384,000 of general Matchmaker funding. Matchmaker funds covered 43% of total IMC.

Figure 10. Wx+H Installed Measure Costs by Fund Source



¹⁷ Prevailing wage reporting requirements magnify or contribute to other low income weatherization cost drivers including general increases in labor and materials costs and additional reporting, quality assurance and more standard work specifications driven by building and other codes.

¹⁸ As a general rule, pilot projects involve significant additional investments in data collection and reporting, developing new procedures and contracts, and training and outreach to build staff and partnership capacity. Although there is not clear standard, WX+H share of costs for support activity relative to funds invested in direct services is consistent cost patterns observed by the author in evaluations more 50 pilot projects over 30 years.

Lesson Learned

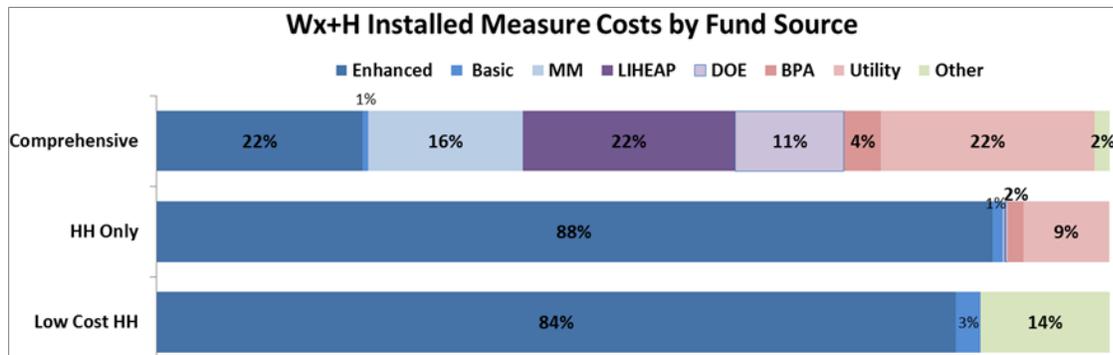
The Wx+H program was effective at leveraging weatherization funding. Two grantees (YVFWC and KCHA) had modest success leveraging home visit services and low-cost measures. Other grantees had in-kind assistance and support from community partners. Agencies and their partners estimated the value of this leverage at \$200 to \$300,000, or about 10% of Enhanced Wx+H funding.

The program was less successful in leveraging non-weatherization funds for HH measures or repairs. Only about \$45,000 (or 2%) of measure costs for Wx+H projects were leveraged from community partners.

The largest barrier to leveraging resources for measures or services was the lack of time to build relationships and the compressed timeline to complete projects. Most sources of leveraged funding are not under the control of CAP agencies, and many have their own application process and wait lists. Often, there simply was not enough time to pursue other funds or, if funds were available, to coordinate services.

Enhanced Wx+H dollars were the primary funding source for HH-only and low-cost HH projects (Figure 11). The leverage for HH-only projects, mainly from utilities, covered air sealing and other low-cost measures. The leverage for low-cost projects was largely for low-cost measures supplied by public health partners.

Figure 11. Wx+H Installed Measure Costs by Fund Source and Wx+H Project Type

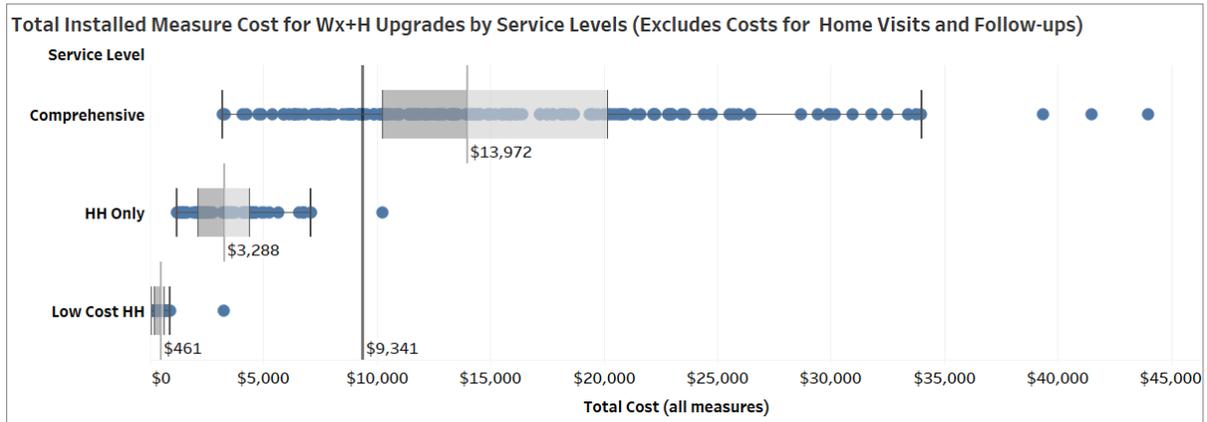


Unit Installed Measure Costs

There is a very wide range in IMC for Wx+H projects. Most of that variation is driven by weatherization costs in comprehensive projects. As illustrated in Figure 12:

- IMC ranges from **\$74 to \$44,003** for all upgrades
- Median IMC for all Wx+H projects: **\$9,341**
- Median IMC for HH-only projects: **\$3,288**
- Median IMC for comprehensive projects: **\$13,972**
- Median IMC for all single-family weatherization projects (FY 2016 -2017): **\$10,200**

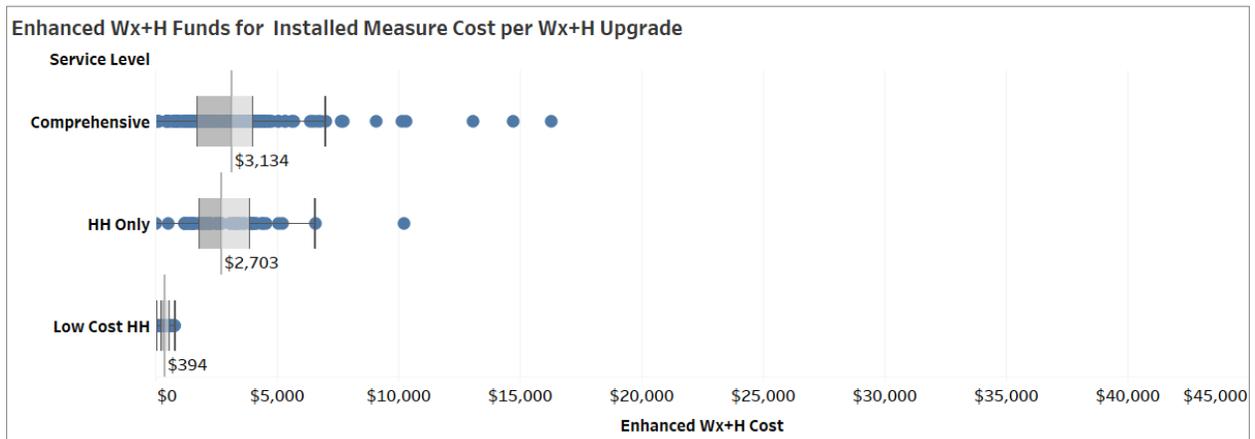
Figure 12. Wx+H Distribution of Installed Measure Costs by Wx+H Project Type



The median additional cost of Wx+H funded measures was \$3,075. The median IMC for comprehensive Wx+H upgrades is \$4,000 greater than the median cost of single-family weatherization projects in the same period (Figure 13). This \$1,000 higher median cost is likely a reflection of two factors:

- A higher incidence of more costly weatherization measures (windows and HVAC replacement) as reported above.
- Most enhanced grantees are located in higher-cost urban settings.

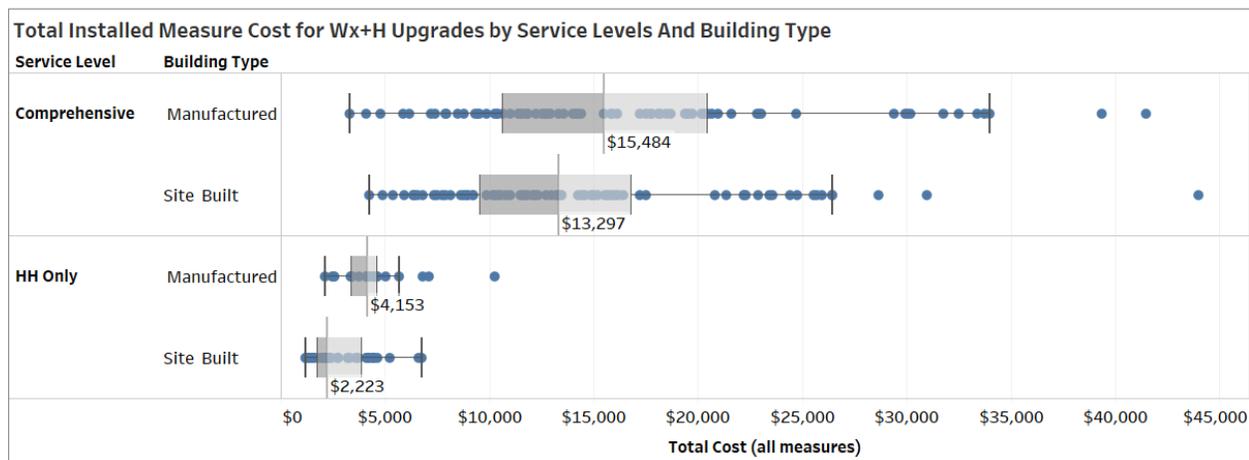
Figure 13. Distribution of Enhanced Wx+H Funds per Project



IMCs were higher in manufactured homes than single-family, stick built homes. This was largely linked to roof and other repairs in manufactured homes (Figure 14).

There were no clear differences in average or median total IMC by primary space heat; year home was built; if clients were referred for asthma, COPD, or other conditions; age of people referred; and income qualification levels. A full discussion of program costs and benefits will be included in the Wx+H impact and cost-effectiveness analysis.

Figure 14. Wx+H Distribution of Installed Measure Costs by Building Type



Enhanced Grantee Wx+H Program Delivery

The eight Enhanced Wx+H grantees delivered services using very different models. This section summarizes the approaches used and what was learned across the agencies. A detailed profile of each grantee that summarizes the partnership structures and delivery strategies is included in Attachment 3. Two types of home visit and community partnership models were proposed, as described below.

Community Partnership Models

- **CHW Partnerships:** Three grantees established partnerships with other entities that have staff and experience offering home visit services:
 - King County Housing Authority (KCHA) and Pierce County Human Services (PCHS) established partnerships with local public health departments.
 - Yakima Valley Farm Workers Clinic (YVFWC) CAP subsidiary, the Northwest Action Center, partnered with the YVFWC Medical Clinic-based Asthma Home Visit Program.

All three of these projects struggled to maintain home visit capacity and services. Rather than the medical and public health sector serving as a source of leveraged resources as originally anticipated, Wx+H funding helped maintain general capacity for community-based home visit services.

- **Referral models and in-house education:** The remaining grantees worked with community health partners for consultation and referrals, but provided all program services (weatherization, HH, and home visits/education) in house through the weatherization program staff. The Opportunity Council (OPPCO) and Spokane Neighborhood Action Partners (SNAP) applications proposed a referral model from the outset. Snohomish County Human Services (SCHS), Blue Mountain Action Council (BMAC), and Yakama Nation Housing Authority (YNHA) application proposed CHW partnerships initially, but went to an in-house model when proposed partnerships did not materialize and/or when the grant was funded for less than requested.

Agencies that relied on internal staff for education efforts focused on energy efficiency, HH measures, and environmental triggers. They were less likely to provide case management services or address health and medication management issues because internal staff did not have the skills and training to do so.

Building Community Partnerships Was Challenging

Grantees reported that establishing and maintaining community partnerships for service delivery and referrals required significant effort. Most grantees struggled to establish and maintain effective, stable working relationships with community partners because of staff turnover, and lack of time and resources to build and maintain these relationships.

Despite these initial challenges, grantees indicated that most of the partnerships they formed were valuable and indicated a commitment to maintaining them in some form. In cases where these partnerships were not as effective as hoped, grantees explored other possibilities.

All grantees indicated that allies, stakeholders, and contractors found the Wx+H model compelling. The potential for weatherization and health measures to have a profound impact on the clients' health and well-being was easy to convey to partners, much more so than the effects of energy and cost savings. Six of the eight grantees shared unprompted stories of contractors “going the extra mile” to provide services to clients when grantees came up against program spending caps. While this sentiment did not directly translate into referrals, the broader message was valuable in building and maintaining support for weatherization services in the community.

Challenges in Partnering for CHW Services

The three grantees that worked with public health or medical clinics were very clear that their partners provided an essential service, and valuable medical and public health skills and knowledge, to their clients. These skills were not available among existing weatherization program staff. Two challenges in working together were identified.

- **Lack of systems for sharing data and case notes:** Grantees did not have the time or resources to develop formal systems to share data and case notes with CHW and weatherization staff. For two of the grantees (KCHA and YVFWC), exchange of information among weatherization and CHW staff was limited to coordinating schedules and reporting services provided. PCHS initially shared results and progress on an informal spreadsheet system when initial plans to use REDCAP software could not be implemented in both organizations. This informal data sharing was supplemented by regular meetings to discuss cases that were quite useful. These face-to-face meetings among weatherization staff and CHWs ended when CHW funding ended.
- **Managing culture differences with public health and medical providers:** Working relationships were also hampered by differences in organizational culture between local weatherization agencies and public health/medical providers. Table 10 summarizes differences reported during interviews and site visits.

Table 10. Organizational Culture Differences

	Weatherization Agency	Public Health/Medical
Client outreach	Clients come to the agency	We go to you – meet you where you are
Application support	Client is responsible for the right paperwork	Do whatever it takes to enroll clients
What is addressed	Focus on the building	Focus on the person
Service orientation	Install physical measures to address energy use, health, and safety	Case management and linkage to other services and the community
Who is serviced	Focus on the self-motivated – likely to succeed	Serve all who have needs – move them toward more self-motivation
Rule orientation	More rule-based	Less rule-based

The approach to the application process illustrates this difference. CHWs in King County would make multiple visits to clients and hand-deliver application materials to applicants. In some cases, they hand-delivered completed documentation to KCHA. CHWs were also able to notarize applications and supporting documentation on the spot, saving a trip or costs to notarize documents. In contrast, weatherization clients applying through normal channels would need to download forms and navigate the application process by themselves, or with limited phone assistance from KCHA intake staff.

The public health lead for Pierce County noted that one of the most important processes for the grant was the regular case review meetings between public health and weatherization staff. These meetings reduced the culture gap and strengthened the capacity of both agencies.

Challenges in Referral Partnerships

All eight grantees identified community or medical partners as referral sources in initial grant applications. The initial expectation of grantees was that most outreach and referrals would come through local partners. This did not work out as planned.

Most (77%) clients and projects came from agencies' existing weatherization and energy assistance queues, 16% were from public health or medical clinics, and the remainder from agency-operated programs (Figure 15).

Figure 15. Sources of Referrals for Enhanced Wx+H Projects (n=254)



Most community partnerships did not yield many actionable referrals:

- Of the eight grantees, only the YVFWC developed and maintained a referral partnership with the Clinic's Asthma Home Visit Program, which consistently yielded referrals that lead to completed projects. The YVFWC minimum requirement for program entry was having at least one member of a household diagnosed as having poorly controlled asthma, as verified by medical screening. Two-thirds of completed projects were originated by Asthma Home Visit Program referrals, and one-third were originated by the weatherization program and then screened by the Asthma Home Visit Program. One of the keys to YVFWC strong referrals is that the partnership focused on serving households with asthma and not households in need of weatherization services. Two-thirds of YVFWC projects did not include weatherization measures other than minor air sealing.
- KCHA partnered with the King County Public Health Asthma Program. The grantees' expectation was that two-thirds of the KCHA projects would come from SKCPH and the remainder from among KCHA's existing clients. Despite large numbers of referrals from the Asthma Program and intensive efforts on the part of SKCPH CHWs to encourage and support households to apply, only seven of the Asthma Program referrals resulted in a completed project. Three quarters of KCHA's completed projects came from existing KCHA clients.

- The SNAP project manager invested heavily in providing direct community outreach, and networking with CHWs and medical providers at three different clinics. The project manager found that linking with the CHW network and receiving CHW training was particularly helpful. Even with this intense outreach effort, one third of referrals came from community outreach and partners; the remainder of successful projects came from weatherization and energy assistance clients.
- PCHS initially proposed a partnership with the TPCPH Clean Air for Kids initiative and asthma consortium. When those initiatives lost funding, Pierce County funded the TPCHD CHW outreach work and home visit services. Pierce County and the health department conducted an intensive community outreach effort, including outreach to community health clinics serving DSHS clients, mobile home parks, other public health allies in the asthma consortium, and PCHS Early Childhood Education Program. These efforts yielded some referrals, but only one in ten completed projects were initially referred from these sources. The remaining clients came from weatherization and energy assistance clients that were referred to CHWs for initial home visits and HH screening.
- While OPPCO found partnership building a valuable, long-term investment, referral relationships yielded only a handful of viable projects. OPPCO originally proposed to partner with a local health alliance. The work was challenging. When the local health alliance that was identified by OPPCO as its key community partner was dissolved before the grant started up, the OPPCO pursued direct outreach with clinics serving low-income providers. This required a significant investment to build relationships and educate clinics on the Wx+H model so they would keep it top of mind. OPPCO also pursued alternate strategies, such as working with a low-income clinic hospital liaison and Western Washington University nursing students. These investments were just beginning to pay off in referrals when the program funding ended. The OPPCO continued its ongoing partnership with the Nooksack Tribe – one of the agency’s long-term allies. While there was some interest with the tribe, other tribal health issues, such as maternal health and addressing opioid addiction, pushed Wx+H out.
- YNHA initially planned to deliver services jointly with CHWs at the Indian Health Service clinic. YNHA found it difficult to engage the clinic because the \$50,000 start-up grant was not large enough to attract interest, and YNHA reported that they did not have time or appropriate staff capacity to establish and maintain relationships. YNHA staff also noted their remote location, limited funds, and the requirement that clinic staff attend HH Essentials training as significant barriers. Instead, YNHA relied on informal community networks and its existing queue.
- BMAC initially proposed a partnership with the Health Center, a community clinic serving the local school population. BMAC did receive a limited number of referrals from the clinic, but no referrals led to completed projects because the referred households were not well matched to weatherization program qualification requirements or were not willing to complete the application process. Instead, BMAC relied mostly on finding clients among existing weatherization and energy assistance clients.
- SCHS proposed partnerships with the Tulalip Tribe, schools in rural Snohomish County, and the agency’s Early Childhood Education and Assistance Program workers. Weatherization staff made initial contacts with these organizations but, due to staff and leadership turnover, did not have

the resources to follow up on this work. The County scaled back community outreach efforts and focused on serving existing weatherization and energy assistance clients. No completed projects resulted from outside referrals.

Wx+H Identity as a Pilot and Separate Program Complicated the Referral Process

Grantees reported that positioning the Wx+H program as a pilot project with a separate focus and identity complicated efforts to build referral relationships with medical and public health providers who were unfamiliar with weatherization services. It contributed to a perception that weatherization services were temporary and not accessible in the long term. Some grantees reported that when the program funding ended, some providers had the impression that all weatherization and HH funding and services for asthma and respiratory clients was no longer available. This reinforced the impression of some providers and partners that weatherization services were difficult to apply for and not readily available.

Grantees suggested that a referral relationship for general weatherization and HH services was easier to maintain over the long haul than a relationship to a specific program and initiative. Even if Enhanced Wx+H measures are not funded, clients with respiratory disease would benefit from general weatherization services.

Integration with the Medicaid Waiver Process and Accountable Communities of Health

Commerce encouraged grantees to reach out to local ACH to encourage the inclusion of weatherization and Wx+H services in community tool kits, with the eventual goal of increasing integration of services and securing additional resources for referrals, assessments, and home visit services. Commerce outlined the ACH and Medicaid Waiver process during conference calls and encouraged grantees to comment on and participate in the planning process. Four of the grantees – OPPCO, SNAP, KCHA, and PCHS – actively worked with their local ACH. Efforts to integrate Wx+H with the Medicaid Waiver process were set back by the loss of Wx+H capacity, momentum, and ability to engage at a critical point in the ACH planning process because of the delay in passing the capital budget in 2017.

Despite these challenges, grantee efforts yielded some success in long-term positioning. Partly as a result of this work, weatherization was mentioned in four of the nine statewide ACH project plans. While historically there was general recognition of the value of weatherization services in addressing chronic conditions in the public health community, it is a significant milestone to have more formal recognition.¹⁹

Modest opportunities to improve coordination and integration of weatherization into the ACH process exist in limited areas of the state. All nine ACH have committed to operating projects to address chronic disease metrics that include asthma, so there are likely to be some targeted services in most ACH regions to address asthma as ACH finish planning in 2018 and move to implementation in 2019. However, competition for limited resources is fairly intense. Thus, while there is general support for proposals relating to asthma and community-based services, other Medicaid cost drivers including opioid addiction, mental health, and obesity have been identified as higher local priorities for direct investment in most ACH. And, while there is general support for a Wx+H model and willingness to include it as a “nice to have” addition to some local toolkits, at this point it does not appear that specific initiatives related to Wx+H are included in any of the state’s nine ACH.

¹⁹ Kramer, Bradley. Asthma Program Manager, Seattle King County Public Health, email communication, February 16, 2018.

Lesson Learned

There was insufficient time and staff capacity to maintain community partnerships within the limits of the grant period. The consensus of the grantees was that there was interest in maintaining ongoing referral arrangements with community partners, especially medical and public health organizations. In the absence of dedicated ongoing funding and resources, these grantees would focus on serving existing clients and community partners would serve as secondary referral sources.

Recommendation

Community partnerships and referral relationships should be encouraged as a longer-term strategy for building and maintaining support for weatherization services in communities. Continued engagement with the ACH process should be supported or allowed where weatherization is included ACH plans. In the absence of increased or stable Matchmaker funding and dedicated funding for Wx+H services from the Legislature, community referrals and formal partnerships should be allowed – but not required – for providing Wx+H measures and services.

Screening, Application Process, and Client Retention

Each grantee used a somewhat different process to identify and screen potential applicants for comprehensive Wx+H services. The screening process occurred in three stages. Clients that had a strong outside referral partner used an initial pre-screening process. These screened clients were then referred to local agency intake and application processes. Clients who successfully applied and passed weatherization intake screens were then audited to assess weatherization potential, and screened using the PSS to assess HH hazards and remediation opportunities.

Pre-Screening Clients before Intake

Most referral partners did some form of pre-screening of potential clients. The quality of pre-screening depended on how familiar the referral partner was with LI Weatherization Program eligibility requirements. Common reasons for screening out clients at this stage included:

- Not having documentable respiratory disease,
- Not being a homeowner, or
- Not meeting income qualification levels or not being able to provide documentation.

The examples below illustrate the challenge of converting outside referrals to completed weatherization projects.

Blue Mountain Action Council – School Clinic

The School Clinic provided BMAC with 12 referrals, none of which resulted in a project. Of the 12 referrals, six did not qualify due to income levels, three were renters with uncooperative landlords, and three indicated they were not interested or not willing to complete the application process.

King County Asthma Program

The screening process started with a pool of 238 SKCPH Asthma Program participants in the KCHA service area (King County excluding Seattle). As shown in Table 11, all Asthma Program participants were income qualified. Of these, 39 (16%) could not be contacted or initially rejected the invitation to participate. KCHA staff noted that some of the initial rejection was from client fatigue because participation in the Asthma Program involved multiple visits and follow-ups, and extensive data collection.

Of the Asthma Program participants, only 68 (29%) were referred to KCHA and given an application. Of the 68, and only six (3%) of the initial referrals received comprehensive services. Most of those screened out were renters or those living in multi-family units. Renters and multi-family units were not targeted by KCHA for services in the Wx+H pilot phase because of the difficulties in securing landlord participation and providing Wx+H measures in multi-family buildings. All of the 68 households that were contacted received home visits and low-cost measures through in-kind contributions. However, only 10% of those given applications received comprehensive services. It is possible that some of the 60 who were given applications may apply and receive weatherization services at a later date.

Table 11. Disposition of King County Asthma Program Referrals

Category	Number
Potentially eligible by address and approached	238
Could not be contacted or initial rejection	39
Eligible, interested, and contacted	199
Not referred to KCHA	131
Multifamily (5+ units)	94
Home previous weatherized	14
Does not want to talk to landlord	7
Landlord refused	6
Not interested	5
Unstably housed or homeless	4
Outside of service area	1
Referred to KCHA and given an application	68
Comprehensive services provided	6
Low-cost or HH only	2

Weatherization Intake and Application Process

The King County data, and reports from public health and other referral partners, highlight that the LI Weatherization application process was a major obstacle to providing services for those who might otherwise be eligible for them. Since demand for weatherization services often exceeded available funding, and extensive rules and requirements are attached to federal funding, there is little incentive to actively recruit clients or streamline the application process.

Applying for weatherization services involves filling out a long form and providing extensive additional documentation of income, assets, and citizenship – some of which must be notarized. Because of the need to provide notarized documents, the applications often need to be returned in person and may require one or more visit to the weatherization agency to file paperwork or address concerns.

Once an application is made, the review and approval process could take weeks and sometime months. Once a decision is made, income and eligibility determinations expire in 12 months. Grantees who contracted for CHW home visits provided extra assistance to potential clients to fill out and file paperwork, which did help. However, as illustrated by King County and BMAC data, many potential Wx+H beneficiaries looked at the application form and the requirement for supporting documentation and walked away.

Once the application process was complete, the weatherization process required multiple household visits for the energy audits and HH assessment, for contractors to bid and complete the work, and for

quality control and inspection visits. Six to 12 home visits are common for routine weatherization projects. The Wx+H services added four to six additional visits.

Most visits, especially those by contractors, can only be scheduled during weekday working hours. Evening and weekend work is cost-prohibitive because of prevailing wage requirements. Consequently, it was difficult for younger households with working adults to participate in the program. It is not surprising that participation in low-income weatherization in general, and Wx+H in particular, is skewed to the elderly who are more likely to be home.

CHWs in Pierce County reported that the complex application process and intensive participation requirements also had the effect of screening out the most medically vulnerable clients, such as those with severe illness, depression, or other physical concerns that made it challenging for them to apply.

Relying on Existing Clients

Because of challenges in getting good referrals and then getting potential participants through the application process, grantees relied on their existing weatherization and energy assistance applicant queues to fill their pipeline. During site visits, grantees observed that prioritizing the medically vulnerable and including modest HH measures in weatherization projects “was an obvious extension of their work.” However, many grantees had not systematically considered health concerns in the intake process, and assumed that it would be challenging to find clients with asthma and respiratory conditions among existing clients. When weatherization staff looked, they discovered existing clients were likely to have respiratory illness. Successful strategies for outreach to existing clients included:

- Adding asthma or respiratory screening questions to intake scripts and applications.
- Training energy auditors, crews, and screeners to look for signs that clients may have asthma or COPD (such as medications or oxygen equipment).

Screening after HH Assessments

All agencies tracked clients who were referred for services and had initial HH assessments funded by Wx+H. Most grantees conducted HH assessments and screenings with weatherization staff prior to final application or final determination of level of service. The data in Table 12 represents the outcomes for the pool of 373 pre-screened “good prospects” who received Wx+H-funded HH assessments. Of these, 157 (42%) received comprehensive Wx+H services; the remainder received partial or no services.

Table 12. Reason for Screening Out of Services after HH Assessment

	Total	No Services or Low Cost	HH Only
N =	196	131	65
Previous weatherization	68 (35%)	18 (14%)	50 (77%)
Home Condition	38 (19%)	31 (24%)	7 (11%)
Landlord	22 (11%)	22 (17%)	
Application	20 (10%)	20 (15%)	
Client issue (moving)	16 (8%)	16 (12%)	
Income	12 (6%)	12 (9%)	
Unknown	20 (10%)	12 (9%)	8 (12%)

A total of 65 (17%) of those getting HH assessments only received HH measures; in most cases, these were homes that had been previously weatherized. The largest share of these projects was from YVFWC. The YVFWC screening model focused on occupants who had been referred for poorly or uncontrolled

asthma, assessed for weatherization potential, and provided HH services regardless of whether full weatherization was needed. Most other grantees prioritized screening for weatherization potential first and then on providing additional HH measures because program guidance and delivery models prioritized weatherization services.

The remaining 35% of projects that received assessments did not receive Wx+H services (41 projects) or low-cost measures, and an initial client education visit (90 projects).

- One-quarter of no/low cost service households did not move forward because of the condition of the home. This included major structural problems, mold, electrical, extensive pet damage, vermiculite, or plumbing issues that drove costs beyond the cost caps for Wx+H or health and safety expenditures.
- 12% of units dropped out after intake for client contact issues: the clients moved away, passed away, or did not maintain contact for other reasons.
- About one in 10 of those who received assessments were screened out for being over income, or were not willing or able to provide required documentation after the HH assessment. This usually occurred when the initial referral or assessment was provided by public health partners, and income screening and intake occurred after homes were assessed.

Client Retention

Client retention was not a concern. Less than 10% of participating households dropped out after initial recruitment and eligibility was established. Most of these dropouts occurred after measures were installed and during the follow-up phases.

HH Assessment and the Pollution Source Survey

The HH assessment process was not consistently delivered among enhanced grantees. All grantees were required to complete a PSS and mold assessment to document household hazards for all projects where weatherization and health measures were installed. Because this is required documentation for all weatherization projects, it was completed by weatherization program staff as part of the energy audit or, for some grantees, as part of HH intake and assessment by all grantees.

The PSS was developed in 2009 and was initially fairly primitive. It was intended to be filled out quickly and provide a high-level assessment and documentation of health conditions. Hazards were identified on a yes/no checklist. During the Wx+H grant start up, the OPPCO recognized the limits of the 2009 PSS and developed a customized update, which was made available to other grantees.

OPPCO's PSS revisions were a major improvement. Revisions included listing additional hazards and converting the yes/no checklist to a four-point scale (0 = none to 3 = major) with examples and a codebook to illustrate what constituted a score. However, grantees were not required to use the revised instrument and five of the agencies used the 2009 version of the PSS. It was also evident that the two agencies using the revised PSS for the first time needed additional training in proper scoring.

Grantees had the option of using alternate tools. The three grantees that provided home visits conducted additional HH assessment and education during home visits. These visits occurred as a separate process from the energy audit. Three grantees initially considered conducting joint energy audits and HH assessments as way to coordinate and reduce client visits. This approach was found to be

infeasible given challenges in scheduling and the volume of information that was covered, which overwhelmed the clients.

Although all agencies qualified projects on the basis of medical need, medical need was not a major driver for scopes of work for installed measures. Only two grantees (PCHS and SNAP) had structured processes for sharing HH visit information to inform service plans and scopes of work.

Agencies and CHWs indicated they lacked tools and resources to make evidence-based recommendations to prioritize HH or weatherization investments, and tailor them to address specific health concerns. One situation cited by multiple agencies was whether it was better to invest in advanced ventilation or to remove carpet and replace it with low-VOC flooring if funds were only available to install one measure. Would the recommendation be the same for a client with asthma or a client with COPD?

Lesson Learned

Agency delivery of HH assessment services was hampered by the lack of clear direction and updated assessment tools. Most agencies defaulted to using the minimum requirement in policy guidance, the 2009 PSS, which was generally inadequate.

Recommendation

OPPCO's new PSS tool is a significant improvement and should replace the 2009 instrument. Additional recommendations include better data collection to determine if occupants were medically vulnerable, and revising and adding assessment measures. The revised tool should be included in routine data collection for all LI Weatherization projects. Additional work is needed to strengthen the HH assessment process and integrate HH assessment findings into weatherization scopes of work.

Agencies and their partners requested more information, resources, and guidance to develop appropriate scopes of work, prioritize measures, and assess which physical interventions are likely to yield better health outcomes. Given the tremendous diversity in occupant and building needs, it is not feasible to establish highly structured protocols. However, additional general guidance on strategy and priorities given limited funds would be helpful.

Client Education Home Visits and Follow-Up Visits

Multiple studies of multi-faceted asthma intervention programs established that the most effective education strategies provided at least one – and up to three – home visits covering:

- Assessment and management of environmental triggers,
- Medication and asthma control strategies,
- How to manage and maintain efficiency and HH measures, and
- Overall case management and referral to health and social services.

The program was designed to have the initial assessments and intake be followed by home visits at 3, 6, and 12 months to follow up and reinforce initial work. Extensive research literature has established the efficacy of assessment and behavioral change models deployed by CHWs, which combine data collection with evidence-based strategies for assessing household needs, and working with clients to identify concrete action and behavior changes.²⁰

²⁰ Butterfield et al., 2011, and Schueler, 2015.

Home Visits and Client Education

All grantee and community partner staff providing Wx+H assessment, education, and quality control services were required to take [Healthy Home Essential Training](#), a two-day overview focusing on “the connection between health and housing and how to take a holistic approach to identify and resolve problems that threaten the health and well-being of residents.” The course is primarily oriented to understanding and assessing building systems that may contribute to environmental triggers and affect occupant health and safety, and identifying potential remediation strategies. The training had a limited focus on working with clients to address environmental triggers; it was not intended to address the specific needs of people with asthma and COPD.

Weatherization agency staff indicated that they did not have expertise, training, or medical knowledge to address asthma control strategies or provide case management services to clients. Three grantees relied on CHWs to provide these services; four grantees that did not have partners who provided home visits did not address medication, or medical or case management needs. The client education lead for SNAP sought out the local CHW network and received training in motivational interviewing, working with asthma and COPD clients, and the health and medication needs of these clients. As a result, the lead was much more comfortable in addressing both topics. Because this person was inside the agency, they were able to work closely with the auditor to coordinate services. This model provides a lot of promise.

Four of eight enhanced grantees relied solely on internal staff for client education. For the smaller agencies, this was typically intake staff or the energy auditor. For larger agencies, client education was provided by dedicated intake/education staff. The education provided by weatherization staff was oriented to energy efficiency principles, understanding environmental and home triggers, and establishing simple plans to manage them (such as removing toxins, green cleaning, and encouraging smoking cessation). Few weatherization agency educators had specific training in client behavior change models, modifying and addressing medication or other medical management concerns, or connecting clients to further services that are crucial to the work of CHWs.

For the three grantees that partnered with another organization for home visits, client education occurred in parallel. The weatherization agency provided information on energy management and managing measures while the CHW focused on medical issues, medication, and case management. CHWs who received HH Essential Training found the information on building systems and measure interventions very useful and complementary to CHW training and knowledge.

Efforts to cross train and share information among community partners and weatherization program staff are essential. On grantee, PCHS, regularly brought together CHW and weatherization staff to review cases and develop service plans. This was very valuable and considered a best practice. KCHA found it helpful to invite CHWs along on an audit to understand what the process involved.

Program guidance encouraged public health and medical clinic partners to get training in building systems. However, the requirement that all people delivering services funded by Wx+H receive HH Essential Training was a barrier to engaging some community partners. The training required travel and involved significant costs for course fees and time away from work. There were provisions in policy for exemptions – for equivalent training – but many partners were not aware of this, and had limited capacity and resources to seek exemptions.

Addressing Complex and Diverse Health Needs

All grantees were challenged to address the more complex, diverse medical needs presented by clients, who included people with both asthma and COPD. Seven of the grantees served clients with COPD or other respiratory conditions for the first time. Education, assessment needs, and physical intervention strategies for COPD are different than those for asthma, and are less well established. For example, one grantee reported that when they went from focusing on children with asthma to working with older clients with COPD, they lost a critical behavioral change motivation to address smoking cessation (or moving smoking outdoors): protecting the child's health.

Agencies focusing on high-needs homes found that many clients had other comorbid conditions including depression, hoarding, cancer, and heart disease, which went far beyond the topics covered in basic HH training. While it is beyond the scope of this program to directly address comorbid conditions, a need for additional training was clearly identified to determine if clients were good candidates for services or, if not, where and how to refer them to other health and social services. Most agencies identified a particular concern for addressing mental health situations. Agencies with CHW workers had somewhat better capacity to refer clients for assistance, but were also clear that their training and skills for addressing mental needs were insufficient.

Lesson Learned

HH Essential Training, while valuable, focused primarily on addressing the building, not the needs of clients with respiratory conditions. Insufficient guidance, resources, and tools were available to grantees regarding the expected content and structure of client education services. Agencies did report that networking with other grantees to share resources and identify tools was helpful.

Client education services were delivered inconsistently across grantees. Grantees that did not work with a public health or medical clinic, or as in the case of SNAP, pursue additional public health training, were ill-equipped to address the specific needs of clients with respiratory conditions. All grantees found they were not trained to address clients with comorbid conditions, especially clients with mental health concerns. Efforts to cross train and coordinate among weatherization program staff and public health staff are important.

Recommendation

Clear guidance is needed on the expected curriculum and materials for Wx+H client education. A sample curriculum, protocol, and tools should be developed that pay particular attention to working with clients with asthma and COPD.

In addition to HH Essential Training, all people providing Wx+H client education should receive training in CHW skills, and asthma and COPD basics. For education that is not delivered by a certified CHW, training should cover what types of health and environmental trigger management information could be provided by weatherization staff, and when clients should be referred to those with appropriate training and credentials.

Follow-Up Visits

A core part of the project design was that grantees would provide follow-up visits 3, 6, and 12 months after providing services. The design intention was that the follow-up visits would be scheduled from the date of project inspection and provided as in-person home visits. Seven of eight grantees interpreted

the starting date for follow-ups as the date of the initial healthy intake/assessment, not completion of installations. The lag time between assessments, audits, and final inspections was between four months (median elapsed days) and six months (average elapsed days). This meant that follow-up visits “bracketed” measure installation and only extended six months past installation.

Although this decreased the length of the follow-up period, providing education at regular intervals after intake was crucial to maintaining momentum. Educators observed anecdotally that they got more traction on behavior modification recommendations, especially those related to green cleaning and reducing triggers, after measures were installed.

Grantees valued the opportunity to revisit clients after services were provided to see or hear first-hand how their work was making a difference in clients’ lives and to provide follow-up services as needed. Two grantees noted that follow-up visits occasionally provoked unnecessary call backs, but they were fairly rare. The three public health partners also indicated that they appreciated the opportunity for extending client engagement beyond the three-month timeframe typical for most asthma home visit programs.

As with initial client intake, assessment, and education visits, there was a wide variation in client follow-up protocols. Follow-up protocols ranged from intensive home visits offered by trained CHWs using multiple data collection instruments to short phone surveys administered by weatherization program staff, and all points in between.

Very few clients received three follow-up in-home visits. To stretch dollars, most grantees provided one or more follow-up over the phone. Most agencies were not able to complete follow-ups in the six months immediately following the end of the grant, which coincided with the temporary break in Matchmaker funding. Commerce did set aside a small pool of funds to allow enhanced grantees to complete follow-up visits after the main grant ended in June 2017. The contracting process held up dispersal of these funds for six months. This uncertainty led to staff turnover for at least four of the grantees, further delaying resumption of follow-up visits until 2018.

Agencies also reported difficulties tracking and reporting follow-up services. Weatherization program budget and tracking systems are not well suited to accommodate work that occurs after a project is complete. Tracking, reporting, and performance management systems count projects as soon as measures and work are inspected and accounted for. Delaying project closure until follow-ups are completed (6 to 12 months after work is inspected) would significantly complicate weatherization reporting and performance accountability protocols.

Lesson Learned

Clients valued the opportunity for client follow-ups. The lack of clear guidance on the timing, purpose, and expected content of follow ups coupled with discontinuity in funding resulted in inconsistent delivery of follow-up visits and a failure to meet the program’s design intent. Most weatherization agencies do not have the capacity, skills, or tools to deliver follow-up home visits as a means to shape client behavior. Partnerships with public health workers and CHW training have the potential of delivering on the promise of home visits.

Recommendation

Weatherization agencies are not ready nor do they have the expertise to provide screening follow-up home visits focusing on the client's health and medical needs. Agencies should have the option and be encouraged to work with public health partners to seek funding to provide these services. In the absence of stable long-term funding for comprehensive Wx+H services, allow agencies the option using Matchmaker Wx+H funds on a case-by-case basis to support community partners and develop sustainable home visit programs and services. Use optional home visit services to establish clear guidance, protocols, and data collection tools for home visit screening follow-up services.

Organization Stability and Maintaining Capacity

A common theme that emerged during project site visit interviews was that the Wx+H service model was significantly more complex and challenging to deliver than the weatherization service models that agencies were familiar with. This was a major departure from prior models, requiring the confluence of:

- Executive commitment to providing comprehensive services and engaging clients on health related concerns,
- Strong champions that provide stable project leadership at the staff level
- Relationships with health providers, and
- Stable, long-term funding.

Building and maintaining capacity proved challenging.

Executive Sponsorship

The roll out of the Wx+H program coincided with significant turnover in the executive leadership of weatherization agencies because of retirements, health issues, or sabbaticals. During the 18 months of the grant, the executives sponsoring the applications for six of the eight grantees turned over. In most cases, grantees maintained their commitments to meeting targets, but turnover slowed the roll out, and severely hampered efforts to build and maintain community partnerships. For at least one grantee, this clearly changed the trajectory of program. The initial management sponsor for the Wx+H program at SCHS Weatherization Services retired during the early rollout the program. While there was general support for Wx+H services, there was limited capacity and organizational bandwidth to work with the broader community, referral partners, and stakeholders. The focus of the SCHS grant became meeting the grant's basic requirements and delivering the project as a modest extension of existing weatherization services. SCHS returned about 40% of its grant to Commerce unspent.

At the other end of spectrum is OPPCO. The Executive Director was a long-time champion of the HH models and was committed to demonstrating the link between weatherization and client health prior to the Wx+H pilot. The agency has been aggressive in the pursuit of funding, resources, and community partnerships to address health considerations and build organizational capacity. The Executive Director has been personally involved in making the case for HH interventions in the Medicaid Waiver process. It is highly likely that OPPCO will maintain HH capacity regardless of whether dedicated Wx+H funds are available in the future.

Staff Champions

Because the Wx+H model was new, it encountered initial resistance. Among the more successful grantees, a staff champion emerged to lead efforts to develop policies, push through contracting and

assessment changes, make sure the Wx+H households received services, and promote the value of the Wx+H model to other staff. Often, the champion had prior exposure to HH services. As the two examples below suggest, multiple champions are more sustainable than a single program champion.

Pierce County's implementation of the Wx+H model was supported by multiple champions. First, the project lead for the Tacoma Pierce County Health District Asthma Program has worked persistently to maintain partnership with Pierce County Weatherization Program and maintain capacity to deliver home visit services with CHWs, despite very limited and inconsistent funding and staffing. The external public health champion was matched with a weatherization program champion. After encountering resistance among older auditors who had been doing weatherization audits for over 20 years, PCHS hired an auditor from a neighboring agency who had training, personal experience, and was fully committed to HH delivery. This new hire helped make case to the "old timers."

Finally, the Wx+H Lead Weatherization Project Manager for PCHS was a self-described "green cleaning champion" all her life and carried a strong commitment to working with clients and doing "whatever it took" to help vulnerable clients get through the program, as this example illustrates:

"I remember a client who was a widow who had lost her partner of 55 years and was depressed and not eating. When we first visited, we found an ant infestation that needed to be treated. The Pest Management treatment resulted in dead ants throughout the house. The widow was not able to vacuum up the ants because of the depression and weakness from loss of appetite. The dead ants were making it difficult to complete the audit, which required a blower door test as the next step in the project. As part of our service, we gave clients a new, lightweight vacuum. To get the project moving, I offered to vacuum the home to demonstrate the new vacuum. Once I vacuumed the home, the auditing staff could complete the audit and blower door tests, and move the project to the next step and eventual completion of the project."

Reliance on a single champion introduces vulnerability. Much of the success of SNAP was attributed to the efforts the Wx+H Program Coordinator, who single-handedly:

- Provided most of the community outreach, recruitment, and education services to clients;
- Developed detailed policy and procedures; and
- Led efforts to work with the public health community and engage the local ACH.

At the end of the grant, and in the absence of sustained program funding, she took a new job in public health where she could use her new skills. Much of SNAP's capacity to deliver Wx+H services was lost with her departure.

Stable champions did not emerge for three of the grantees (SCHS, KCHA, and YNHA). Each of these grantees experienced one or more turnovers in lead program and administrative staff over the course of grant. These grantees indicated that they are less likely to continue to offer full Wx+H services going forward.

Impact of Inconsistent Funding on Future Plans

During site visits in May and June 2017, grantees reported that, despite the management and organizational challenges they faced, they expected to meet or exceed initial targets. Each reported progress in building capacity and internal support to deliver the new model had been growing. The new approach was just beginning to gain traction.

In June 2017, the initial grant ended, and future funding was put on hold when the Legislature did not pass a capital budget. This resulted in a seven-month break in Matchmaker funding. This impasse ended in January 2018, when partial Matchmaker Wx+H funding was restored. In interviews with grantees in summer 2017 when future funding was uncertain, seven of the eight grantees were very clear that in the absence of dedicated funding, they would not be able to offer fully integrated Wx+H services with funding set aside for community partners. They indicated that much of the capacity developed during the pilot project would not be maintained.

On a positive note, five of the eight grantees indicated interest in providing a scaled-back Wx+H services with their Matchmaker allocation. Further, agencies indicated a willingness to maintain informal referral relationships to help target services to medically vulnerable clients and to provide additional Plus Health measures for a limited number of existing clients. The grantees' individual plans are summarized in the Grantee Profiles (Attachment 3). With the restoration of Wx+H funding in March 2018, additional agencies are expressing interest in providing Plus Health services and rebuilding capacity.

Lesson Learned

It was very difficult for most enhanced grantees to establish and maintain the organizational capacity to deliver full Wx+H services in the absence of stable funding, strong champions, and executive sponsors. The eight enhanced grantees were among the strongest and largest weatherization agencies, and included those with the greatest executive commitment to the Wx+H model. While there is general support for having additional flexibility to install Wx+H measures, at most three of the eight grantees are likely to continue to offer integrated Wx+H services with fully engaged community partners absent stable multi-year funding.

Recommendation

In the absence of stable and ongoing multi-year funding, it is not feasible for most agencies to develop and maintain the capacity to offer the full Wx+H integrated service model. Agencies that have the capacity, executive sponsorship, and access to additional funding can be given the option to provide these services.

Health Impacts of Integrated Weatherization and HH Services

The long-term objective for Wx+H is to support sustainable, long-term investment in low-income housing stock by making the case for continued legislative investment in, and Medicaid/Medicare reimbursement for, appropriate and cost-effective weatherization and HH repairs. As highlighted in Figure 16, it is very challenging to isolate the costs and benefits of HH and weatherization investments.

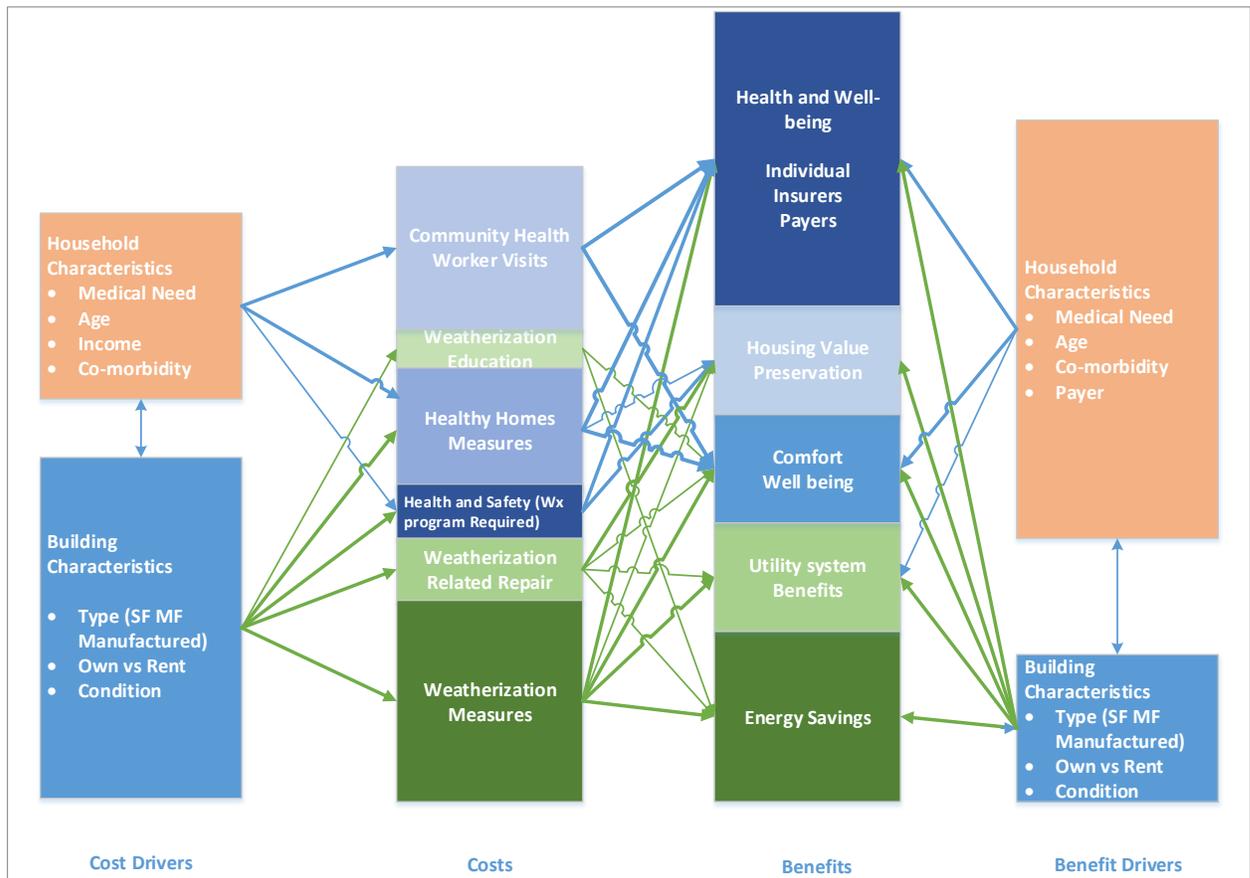
An extensive review of literature on the relationship between weatherization, HH interventions, and health outcomes conducted prior to the grant highlight the analytical challenges in making this case:²¹

- Large sample sizes (>400) are likely required to detect changes in health utilization for weatherization/options or Wx+H models.
 - Measurement for these programs should focus on tracking interventions and assessing if they are delivered to more at-risk populations.

²¹ Schueler, 2015

- Projects that target high-risk clients living in homes requiring remediation are more likely to show stronger effects and greater returns. Smaller sample sizes (100 to 200) may be adequate to detect effects **assuming a similar delivery model**. Asthma trigger prevalence studies suggest that situations requiring significant physical remediation are present in less than 50% of households that include people with asthma. It is difficult to isolate the effects of physical remediation and behavioral interventions.

Figure 16. Low-Income Weatherization and Healthy Homes: A Model of Entangled Benefits and Costs



State-Wide Medicaid Impacts Research

In 2015 and 2016, the WSU Energy Program tested whether it was possible to link data from weatherization agency clients to statewide Medicaid and social service data sets using the state’s Integrated Client Database used for Medicaid services. Initial results found it was possible to match to administrative records if full client name, date of birth, and the last four digits of the social security number were captured. The initial test found 80% initial match rates for weatherization clients receiving any social services from a general sample of weatherization clients,²² largely because of ambiguous and incomplete personal IDs. In response to these findings, the RFQ for enhanced grantees stipulated that agencies set up systems to securely capture and maintain identifying data on those receiving services (Name – DOB and Last 4 SSN) to maximize match. The test match also found that only 45% of those

²² WSU EP Initial Results: Matching King County Housing Authority Weatherization Records with the Department of Social and Health Services Integrated Client Data Base, December 2015.

matching matched as receiving Medicaid services because many weatherization clients were older and received medical care through Medicare, which is not included in the state-maintained data system.

In 2016, Commerce, the WSU Energy Program, and the Washington Department of Social and Health Services (DSHS), Office of Research and Data Analysis, collaborated on multi-year proposal to use a U.S. HUD HH technical grant to match Wx+H client data to the Integrated Client Database. The proposal was not funded. In summer 2017, the WSU Energy Program re-evaluated the feasibility of a Medicaid data match, and projected a likely Medicaid match of 75 to 100 households and 100 to 150 occupants. The match is marginal and may not be sufficient to detect Medicaid utilization results given the high variation in treatments and client conditions. This assessment found the following:

- Of the 212 households receiving comprehensive services, 91 (42%) were occupied by someone over 60 years of age or with a primary diagnosis other than asthma.
- There was wide variation in the physical and educational interventions provided by each of the grantees and among clients for each grantee.
- Those with the highest medical need and most complex issues were often in situations where the home was not treatable due to structural concerns, clutter, or mental or other health-related barriers. Rather than getting higher levels of services, many of these clients only received low-cost measures and education.
- Systems for capturing and maintaining personal identifiers were inconsistent and not always well maintained.

Commerce also felt the high level of investment (\$250,000) required to contract with DSHS to complete the research was not warranted or sustainable, given lower levels of Legislature appropriations for FY 2018-19.

Ongoing Case Study Research

Given the high variation in program execution and limited funding, Commerce and the WSU Energy Program elected to focus resources on completing two case studies on the projects with the strongest data collection systems. These case studies are expected to be completed in the second half of 2018.

Through Matchmaker funds from Commerce, the WSU Energy Program is supporting the ongoing collaboration between OPPCO and Three³ to match client and Medicaid records for approximately 30 household that received comprehensive Wx+H upgrades. As part of this study, Three³ hopes to follow up on approximately 25 additional clients who received services as part of pilot study conducted in 2012.

Also through Matchmaker funding, the WSU Energy Program is working with TPCPH to conduct follow-ups with 59 households receiving Wx+H services from PCHS. A total of 21 homes will receive follow-up site visits and the remainder will receive phone follow-ups. This study will compare pre-treatment and post-treatment outcomes by level of investment (comprehensive vs. HH – low cost) and respiratory condition (asthma vs. COPD) in three areas:

- Symptom control and improvement,
- Quality of life, and
- Number and type of successful behavior changes.

Lesson Learned

The goal of providing a broad demonstration across multiple agencies was not consistent with the goal of conducting rigorous research to establish the effectiveness of these interventions on healthcare utilization. Most weatherization agencies do not have the capacity, systems, and staffing to capture and maintain the data needed for this work. Insufficient time and funding were available to standardize data collection tools and protocols, particularly those for collecting data on the behavior and self-reported health outcomes of clients.

Recommendations

Given the diversity of program delivery, the best option is conducting case study research and estimating the likely range of benefits based on self-reported health outcomes. This will provide general information and support for the benefits, including HH measures as a part of weatherization services.

Statewide research to quantify decreases in healthcare utilization and Medicaid across multiple agencies using administrative records is not currently feasible given existing funding and Wx implementation. It is recommended that agencies continue to collect data needed to allow future studies (name, date of birth, and last four digits of the client's SSN).

Client case studies and grantee interviews provide extensive anecdotal evidence that investment in Wx+H measures result in significant and positive health outcomes for those receiving services, and that non-energy benefits are considerable and likely to meet or exceed measure costs. It is not likely that weatherization agencies can deliver a sufficiently standardized comprehensive Wx+H service, product, or cost structure that would be medically reimbursable. Given reduced Wx+H funding through the Matchmaker Program, Commerce will focus FY 2018-19 funding on installing physical Wx+H measures in the homes of medically vulnerable clients, and will limit direct investment in CHW home visit services for medical screening and follow-ups by local agency staff or community partners.

If the Legislature provides increased and dedicated funding for weatherization agencies to invest in the Wx+H model, and there is a specific charge to develop and quantify health outcome benefits, the WSU Energy Program recommends focusing investments in no more than three agencies, and giving these agencies the specific task of developing standardized assessment and data collection instruments.

The Basic Wx+H Program

In the Basic Wx+H design, all agencies, including those that were awarded enhanced funding, were allocated a share of \$2 million using Commerce’s weatherization funding allocation formula.²³ Agencies had the option of using the funds for weatherization, weatherization repair, developing capacity to deliver Wx+H services, or installing a subset of HH measures in homes eligible for weatherization services.

Basic Wx+H Program Design

The Basic Wx+H option was intended to provide an option to install a minimum set of health and safety measures in homes where weatherization was not feasible. The Basic Wx+H policy authorizing the program was sent to agencies in December 2015. Commerce staff made an early determination that the authorizing legislation clearly linked weatherization and HH measures, and that HH measures were not intended to be delivered as stand-alone measures and education services if Wx was feasible. Basic Wx+H policy required the following to expend funds for Wx+H measures:

- Homes and occupants must be qualified and prioritized to receive weatherization services.
- Homes must be assessed for weatherization needs and receive weatherization services before they are eligible for HH measures.
- The need for HH measures must be documented using a HH assessment tool. The PSS and Mold Assessment is required documentation for all weatherization audits in the Weatherization Program; the assessment was not an additional requirement. However, Commerce did not provide specific guidance on standards for determining need.
- Staff providing Wx+H audits, HH assessments, client education, or Quality Control Inspections must document that they received a certificate of completion for HH Essential Training.
- The basic program policy established a pre-approved list of 14 measures (Table 13) and capped Basic Wx+H IMC at \$2,500 per unit, unless prior approval was obtained from Commerce.

Basic Wx+H Outcomes

Agencies used very little of their Basic Wx+H allocation for optional Basic Wx+H measures. As of November 2017, 13 agencies expended \$270,100 on Basic Wx+H measures (or 16% of the initial allocation) and installed Basic Wx+H measures in 214 units.²⁴ Many of the Basic Wx+H expenditures were by grantees participating in the enhanced program. Of the eight Enhanced grantees:

- Five used Basic Wx+H funds to augment Enhanced Wx+H services (Table 14). Enhanced grantees accounted for 46% of all Basic Wx+H measure expenditures. Of the 62 units that Enhanced grantees completed with Basic Wx+H measures, 40 units were completed as stand-alone Basic Wx+H projects and 22 units were completed with combined funding.
- Eight agencies that did not receive enhanced grants expended funds on Basic Wx+H measures. Of these, two (Clark County Community Development and the Community Action Council of

²³ Commerce allocates funding to agencies based on the local share of people over 18 years of age at or below 125% of the Federal Poverty Level, with additional adjustments for climate zone for DOE, LIHEAP, and Matchmaker funding.

²⁴ Originally, \$2,009,190 was allocated to agencies by formula. KCHA converted its entire basic allocation of \$277,233 (14% of all available statewide basic funding) to the enhanced program. Uptake percentages are based on the remaining \$1.73 million.

Lewis, Mason & Thurston Counties) accounted for 141 (93%) of the 152 installations. The remaining six agencies completed a handful of projects to test the waters.

- Ten agencies did not budget for or expend funds on any Wx+H service or measures. Non-participating agencies accounted for 14% of total low-income weatherization production for FY 2017.

Few Agencies Installed Additional Basic Wx+H Measures

As shown in the Table 14, with the exception of walk-off mats, most installed Basic Wx+H measures were existing health and safety measures that could readily be purchased and installed by weatherization contractors as weatherization program measures. Less than 5% of Basic Wx+H funding was spent on measures that were not already eligible for funding through existing weatherization programs. A review of installation measure profiles in the Weatherization Information Data System found almost all Basic Wx+H measures were installed as part of full weatherization projects and were rarely installed as stand-alone projects – the situation Commerce staff designed for.

Table 13. Basic Wx+H Measures Installed By Grantee Type

Measure	New Basic Measure	All Installations	Basic Grantees	Enhanced Grantees
Total units		214	152	62
Client education	No	134 (63%)	102 (67%)	32 (57%)
CO detector	No	112 (52%)	102 (67%)	10 (16%)
Mechanical ventilation (exhaust)	No	98 (46%)	77 (51%)	21 (34%)
Smoke detector	No	62 (29%)	61 (40%)	1 (2%)
Water heat temp. adjustment	No	50 (23%)	49 (32%)	1 (2%)
Walk-off mats	Yes	66 (31%)	42 (28%)	24 (39%)
Slip and fall prevention	Yes	18 (8%)	11 (7%)	7 (11%)
Green cleaning kit	Yes	37 (17%)	7 (5%)	27 (44%)
HEPA vacuum	Yes	31 (14%)	6 (4%)	25 (40%)
Furnace filter	Yes	10 (5%)	3 (2%)	7 (11%)
Dust mite covers	Yes	22 (10%)	2 (1%)	20 (32%)
Pest mitigation	No - Limited	6 (3%)	1 (<1%)	5 (8%)
Toxic removal	No - Limited	3 (1%)	1 (<1%)	2 (4%)
Mold and moisture abatement	No - Limited	15 (7%)	0 (0%)	15 (24%)

Red shading indicates > 20% of projects had new measures installed that were paid with Basic Wx+H funds.

Table 14. Wx+H 2015-17 Basic Allocations and Expenditures

Measures Installed	# of Agencies	Units Completed with Basic Wx+H	Total Basic \$ Allocated	Spent on Wx+H Measures	Share Basic Allocation (%)
Total	25	214	\$1,731,957	\$270,100	16%
Enhanced Wx+H measures only	2	0	\$205,875	0	0%
Enhanced Wx+H and Basic Wx+H	5	62	\$473,780	\$124,555	26%
Basic Wx+H measures	8	152	\$561,811	\$145,539	26%
No Wx+H measures	10	0	\$510,491	\$0	0%

Given the challenges encountered by Enhanced Wx+H contractors in establishing specifications and finding contractors willing to install new Wx+H measures, it is not surprising that grantees without additional Enhanced funding did not make the significant investment required to develop the contracts and contractors needed to install these measures. In addition to this lack of a contractor infrastructure,

agency surveys conducted during start-up found that, while agencies appreciated the additional flexibility and new measures offered with Basic Wx+H funding, most were concerned or unclear about the new requirements for verifying need, staff certifications, and reporting that went with it (Schueler and Kunkle, 2016). There was a perception (not necessarily accurate) that the Basic Wx+H option involved significant additional compliance requirements, or at least produced uncertainty about what was expected and how agencies might need to account for and justify expenditures.

Lesson Learned

There is a high level of system inertia in the form of existing contracts, rules, and procedures from weatherization program funders that make it difficult for most agencies to take full advantage of additional flexibility. Although Commerce developed clear policies and intentions for the Basic Wx+H program, few formal resources were available to provide ongoing technical assistance and guidance to agencies on how to deploy this flexibility and provide support to address the key barrier: access to contracting services. This suggests that the lack of take-up of prescriptive measure installation options does not represent a failure of the test but, rather, that technical assistance, stable funding, and efforts to reduce constraints from other funding sources need to be in place for prescriptive installation options to flourish.

Recommendation

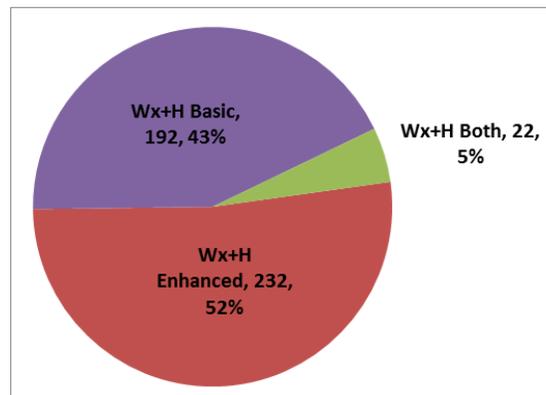
The Basic Wx+H option should be phased out because it was largely not exercised. The 14 measures on the basic measure list should be reviewed. A limited number of new, low-cost measures (such as walk-off mats; green cleaning kits; and measures to reduce slips, trips, and falls) may be added as optional health and safety measures that can be installed with Matchmaker or LIHEAP funds. In adding these measures, Commerce should work with agencies to develop clear specifications and provide other assistance as needed to assure measures are available to clients. Agencies should be able to deploy these measures without having to take specialized HH training or provide measure-specific verification of medical need.

Combined Service Totals for Enhanced and Basic Wx+H Programs

Households Served

Over 500 households and nearly 1,500 people received Wx+H services through local agencies and their partners. Of these, 446 low-income households had HH measures installed that were paid for with Enhanced or Basic Wx+H grant funds (Figure 17). An additional 177 households were assessed and/or received home visits and low-cost measures leveraged from Enhanced grantee partners (Table 15).

Figure 17. Households Receiving Wx+H Funded Measures (n=446)



Almost one in five (18%) of all units weatherized in FY 2017 by Washington’s Low-Income Program statewide had Enhanced and/or Basic Wx+H measures installed. Statewide penetration rates were deeper for single-family units (29%) than

for multi-family units (less than 5%). The single-family Wx+H penetration for Enhanced Wx+H grantees was still higher at 41%.

Table 15. Summary of Households and People Receiving Wx+H Services

Funding Source for Installed Measures	Households	People
All Households Reported	623	1,421
Any Wx+H Funding	446	1,286
Wx+H Basic Measure Funding	214	544
Wx+H Enhanced Measure Funding	254	757
Leveraged Measure Funding Only	177	No data

Most Wx+H projects were completed in FY 2017. Enhanced grantees noted that they had to push hard to meet Wx+H upgrade targets by June 2017. This suggests that a 40% penetration rate is at the upper end of what might be possible for agencies on a sustained basis. When asked if production targets for comprehensive upgrades were sustainable, agencies noted that they could easily be met if given a full two years to recruit and complete projects. This implies that penetration rates between 20% and 25% of typical single-family production are feasible.

Lesson Learned

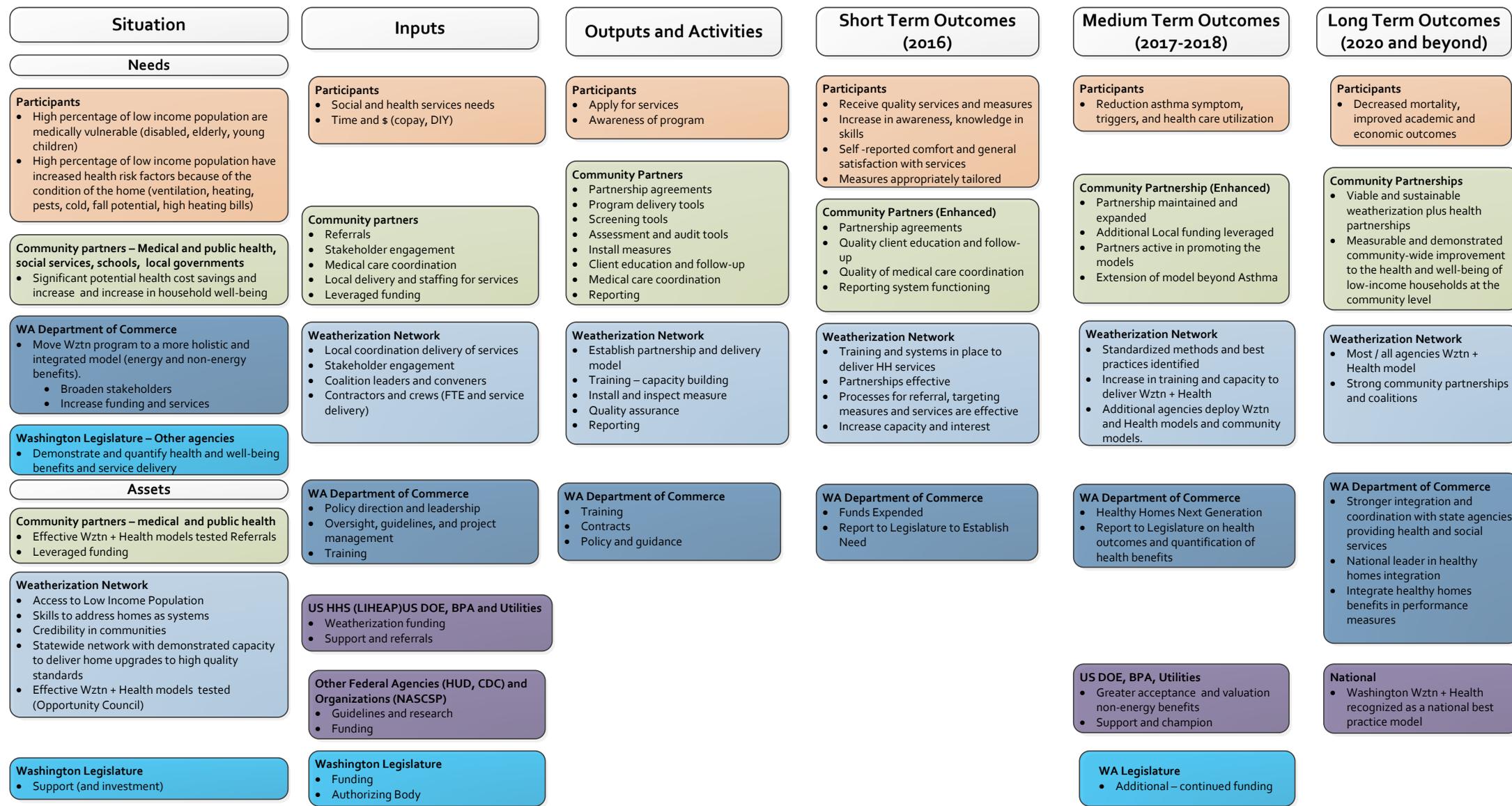
There is demand and need for Wx+H health services among existing weatherization clients. Commerce and participating weatherization agencies were successful in integrating physical Wx+H measures into ongoing weatherization services, especially those targeting stick-built and manufactured single-family homes. Over 500 households and almost 1,500 people received Wx+H services. Approximately one in five of all units and three in ten single-family units received Plus Health measures.

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Attachment 1. Logic Model

Washington Department of Commerce – Weatherization Plus Health -- Stream Lined Logic Model - Draft 2/3/16



Attachment 2. Project Profiles

The Osborn Weatherization + Health Project

The Osborns

- 3-person household:
 - Pregnant mom with asthma
 - One young child
- Purchased home 5 years ago
 - A fixer upper that needed lots of work
- During first pregnancy (prior to Wx + H):
 - 3 – 4 visits to urgent care for asthma
 - Constantly sick
 - Pregnancy-induced diabetes
 - Husband took a lot of time off from work
- Second pregnancy (after Wx + H):
 - No urgent care, not sick, no diabetes
 - Husband did not take time off work



Type of House

1901, two-bedroom, single-family home with natural gas heat (1,968 sf)



Energy Efficiency Measures

- Installed attic and floor insulation
- Sealed and insulated ducts
- Performed air sealing
- Wrapped pipes and installed water heater
- Performed electrical repair
- Cleaned, tuned, and repaired gas furnace



Health Measures

- Installed ventilation fans in bathroom
- Installed carbon monoxide detectors
- Provided Healthy Homes education and green cleaning kit
- Provided walk-off mats
- Installed HEPA furnace filters
- Provided HEPA vacuum cleaner
- Installed dehumidifier in basement



“There is just no comparison – we are all so much healthier and have 90% less stress”

Oriana Osborn

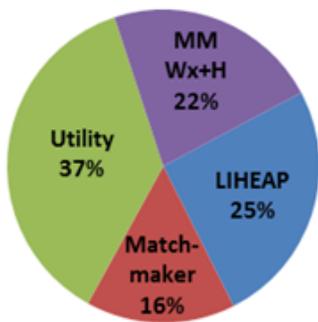
The Osborns found the healthy home training provided valuable information on topics like the importance of having a good vacuum. Less frequent vacuuming with a good vacuum with a HEPA filter is much better than more frequent cleaning with a non-HEPA vacuum.

Funding by Measure and Source

Wx Measures: \$ 2,489
 Wx Repair: \$ 177
 Wx + Health: \$ 1,995
 Health & Safety: \$ 640

Total: \$ 8,953

Funds Blended From Multiple Sources



Weatherization + Health Team

SCHS Wx + H lead: Nancy Stewart
 SCHS Auditor: Joe Anderton
 Contractors: Kalmey Heating
 Vela Brothers Inc.

The information, data, or work presented herein was funded in part by the State of Washington, Matchmaker Program.



Department of Commerce

The Kings Weatherization + Health Project



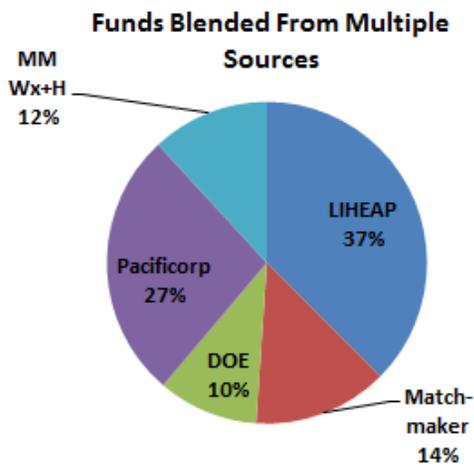
The Kings

- Two-person household:
 - One person with asthma works in home improvement retail
 - One person is retired on disability



Funding Sources

Wx Measures:	\$ 16,611
Wx Repair:	\$ 1,352
Wx + Health:	\$ 2,454
Health & Safety:	\$ 249
Total:	\$ 20,667



Type of House

1976, two-bedroom, double-wide in mobile home community



Energy Efficiency Measures

- Installed attic and floor insulation
- Sealed and insulated ducts
- Replaced seven windows
- Performed air sealing
- Wrapped pipes and installed LEDs
- Replaced disconnected cross-over duct



Health Measures

- Performed HVAC cleaning
- Replaced carpet in master bedroom with low-VOC flooring
- Installed ventilation fans
- Installed smoke and carbon monoxide detectors
- Provided Healthy Homes education
- Provided dust mite covers
- Provided walk-off mats
- Installed HEPA furnace filters
- Provided HEPA vacuum cleaner



"I was really impressed with the BMAC crew's professionalism"

Charles King

Weatherization + Health Team

BMAC Auditor: Pat Adams
 BMAC Inspector: Fernando Avina
 Contractors: BMAC Crew

The information, data, or work presented herein was funded in part by the State of Washington, Matchmaker Program.

The Garzes-Lemus Weatherization + Health Project

The Garzes-Lemus Family

- Two-person household
- Husband with asthma
- Both on disability

“Our home was a mold box. It does not smell like mold now”

Teresita Garzes-Lemus

The Garzes-Lemus family with grandchild



Type of House

1968, two- bedroom, single-wide in mobile home community (800 sf)



Energy Efficiency Measures

- Installed attic and floor insulation
- Installed ductless heat pump and thermostat
- Sealed ducts
- Performed air sealing
- Wrapped pipes and replaced refrigerator
- Replaced disconnected crossover duct
- Performed electrical repairs

Health Measures

- Cleaned HVAC system
- Performed major roof repair
- Repaired ceiling and floor
- Installed/adjusted ventilation fans
- Installed carbon monoxide detectors
- Provided Healthy Homes education
- Delivered four asthma home visits
- Provided walk-off mats
- Provided HEPA vacuum cleaner

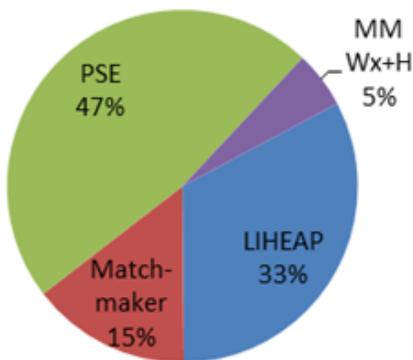
“My husband’s asthma sounds better, he feels better, and he uses less rescue medicine”

Teresita Garzes-Lemus

Funding by Measure and Source

Wx Measures:	\$ 15,148
Wx Repair:	\$ 8,603
Wx + Health:	\$ 1,286
Health & Safety:	\$ 206
Total:	\$ 20,667

Funds blended from multiple sources



Weatherization + Health Team

PCHS Lead: Teri Allen
 PCCC Auditor: Michael Johnson
 TCPHD: Judy Olson
 Contractors: C and D

The information, data, or work presented herein was funded in part by the State of Washington, Matchmaker Program.



Department of Commerce

The Finkbonner Weatherization + Health Project

The Finkbonners

- 11-person multigenerational household on the Lummi Reservation
- Husband works in commercial fishing
- Recent homeowners
- One senior with COPD
- One child with other respiratory conditions
- Multiple systems in the house were failing:
 - Plumbing leaks and moisture in basement
 - Poorly vented woodstoves and range hood
 - Little or no insulation

“Before our home was weatherized, it was very drafty and cold. Our electric bills were nearly \$700 per month in the winter. We couldn’t afford the repairs to fix our home.”

The Finkbonners

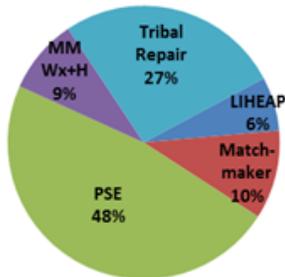


With its large household size and significant needs, additional funds were necessary to make significant improvements in the home.

Funding by Measure and Source

Wx Measures:	\$ 5,149
Wx Repair:	\$ 9,337
Wx + Health:	\$ 3,074
Health & Safety:	\$ 4,216
Tribal Repair	\$ 9,206
Total:	\$ 30,984

Funds Blended from Multiple Sources



Type of House

1932, three-bedroom, single-family home with electric and wood heat (1,412 sf)



Energy Efficiency Measures

- Installed attic, wall, and kneewall insulation
- Installed ductless heat pump
- Sealed ducts
- Performed air sealing
- Wrapped pipes and installed efficient lighting
- Added dryer venting
- Performed electrical repairs (panel failed inspection and knob-and-tube wiring)



Health Measures

- Completed major roof repair
- Completed plumbing repairs in upstairs shower, sewer line, and sump pump
- Installed ventilation fans in bathroom and range hood
- Installed carbon monoxide detectors
- Provided Healthy Homes education and green cleaning kit
- Provided walk-off mats
- Provided dust mite covers
- Provided HEPA vacuum cleaner
- Installed dehumidifier in basement



“After the work was completed, we felt much cozier in our home. We now have a heat source that isn’t a fire danger. Our roof, bathrooms, and basement are free of water leaks. We don’t get colds as often and feel much healthier. Our electric bills are about half as much as they were prior to the work being done.”

The Finkbonners

Weatherization + Health Team

OPPCO Lead: Alan Carbert
 OPPCO Education: Leah Wainman
 Contractors: Energy Savers

The information, data, or work presented herein was funded in part by the State of Washington, Matchmaker Program.



Department of Commerce

Attachment 3. Wx+H Profiles

Provided on the following pages are profiles for:

- Blue Mountain Action Council
- King County Housing Authority and Public Health
- The Opportunity Council
- Pierce County Healthy Homes
- Spokane Neighborhood Action Council
- Snohomish County Human Services
- Yakima Valley Farm Workers Clinic
- Yakama Nation Housing Authority

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Blue Mountain Action Council

Blue Mountain Action Council (BMAC) is one of two local agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Start-up Grant. Start-up grants were made available to agencies that applied for the Enhanced Grant Program but did not score high enough to secure full funding. These grants were intended to build on existing capacity and prepare grantees for full participation in upcoming Wx+H program cycles.

BMAC used start-up grant funds to test referral relationships with The Health Center, an independent clinic serving schools and students, and to integrate Healthy Homes education and measures into existing weatherization services.

While this relationship ultimately did not generate as many referrals as hoped, BMAC found enough eligible clients in its existing weatherization and energy services queue.

BMAC provided comprehensive services to seven households, exceeding its initial target five projects. Less-intensive services were provided to an eighth household.

BMAC reported that the program was very visible and very rewarding. The program attracted resources and extra effort from partners and contractors who wanted to help out.

BMAC Wx+H Clients



Program Delivery Strategy

In the start-up grant, BMAC screened referrals and existing Weatherization and Energy Assistance clients to identify people of all ages with asthma and chronic obstructive pulmonary disease

Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The **initial focus** of the Wx+H Enhanced Grant initiative is assessing the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

(COPD). Screened households were assessed for weatherization and Healthy Homes services, and a coordinated scope of work was prepared.

During the initial assessment, the household received education on maintaining a healthy, weatherized home. At 3, 6, and 12 months after measures were installed, BMAC completed in-home follow-up visits. Measure installations, education, and follow-up visits were provided by BMAC staff and crews, with the exception of some flooring work that was sub-contracted out.

The project built on BMAC's experience as a participant in Washington Healthy Homes Pilot coordinated by the Opportunity Council, where BMAC provided wraparound weatherization and Healthy Homes services to six homes.

Key Lessons

Referrals from The Health Center were not a good match for LI Weatherization

BMAC received 12 referrals from The Health Center, but none resulted in a project. Half were not income eligible, a quarter were renters and

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Blue Mountain Action Council

very difficult to qualify, and the remainder were “turned off by the application.”

Need for Wx+H services among BMAC’s existing clients

BMAC found all of their projects among existing weatherization and energy assistance clients. This was unexpected. Intake and auditing staff received informal training to ask questions and note indications that a household may have respiratory disease and could be eligible.

The eight completed projects comprised about 15% of annual production. With sufficient funding, it is likely this level of effort could be sustained. Moving beyond that would require BMAC to find other community partners.

The \$4,000 Wx+H spending soft cap resulted in some work not being done

Half of the projects included measures that were not done, such as carpet removal and flooring replacement. While there were procedures for lifting caps in consultation with Commerce, it was not always feasible, from a scheduling perspective, to do so.

Communicating the value of Wx+H activity

Health outcomes, while hard to measure, were easier to communicate and were more influential with partners and stakeholder than saving energy and saving money. Contractors were willing in some cases to go the extra mile when some projects hit project cost caps.

Challenges meeting compressed timelines around other high-priority needs

Much of the work occurred in the final quarter of FY 2017 due to delays in Wx+H program startup, winter weather, a major emergency rehabilitation project, and the need to spend out other weatherization funding. Although BMAC crews could do flooring, some of this work was contracted out to help manage workload.

Lack of clear program requirements and specifications slowed start-up and increased costs

BMAC found that their Wx+H program startup was slower than when they participated in the Healthy Homes Pilot with the Opportunity Council, which provided detailed work process flows, lists of eligible measures, educational materials, and training.

Although BMAC has had some experience providing wrap-around services in the Healthy Homes Pilot, it was not clear to BMAC how Wx+H was different and where there was new flexibility. BMAC wanted more specific and standardized guidance on Wx+H processes and requirements. Once the program was underway, BMAC did appreciate Commerce’s flexibility around eligible measures and wanted that feature to be preserved.

Limited funding

The start-up grant was not large enough to fund experimentation or develop new processes, procedures, and relationships with health services providers in the community. BMAC’s experience suggests the need for a more prescriptive model and tools for smaller grants.

Going Forward

BMAC is interested in continuing to offer Wx+H services if funding is available and Commerce maintains flexibility in how it could be used.

Providing more comprehensive Healthy Homes measures to existing clients

Wx+H funding allowed BMAC to address opportunities that were missed due to funding restrictions, such as replacing carpets, cleaning HVAC systems, and providing low-cost Healthy Homes measures. Although some funds are available for repairs and Healthy Homes measures through Community Development Block Grant and city programs, these funds are limited geographically.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Blue Mountain Action Council

Little or no funding was available to provide low-cost measures such as cleaning kits (since the Living Green program funding ended) and HEPA vacuums. BMAC would like the flexibility to provide some of these measures as an option going forward.

Leveraging resources

BMAC had some success leveraging resources from other funding sources, including a grant from the ROE Foundation to provide additional accessibility services to seniors such as grab bars, stair repairs, hand-held showerheads, ramps, and handrails.

These funding sources are challenging to integrate with weatherization funding and are not well reported. The flexibility that came with Wx+H funding was valuable.

Funding for installed measures came from the following sources:

- DOE, Low Income Home Energy Assistance Program, BPA, Matchmaker: 60%
- Matchmaker, Wx+H: 27%
- Utility: 13%

Strengthening relationships with medical providers in the community

The referral arrangement with The Health Center did not result in projects, in part because more time was needed to educate The Health Center staff on weatherization criteria.

BMAC still sees some potential for The Health Center and other medical providers to be sources of referral and to help build relationships with the local public health agency, which has new leadership and may be open to stronger community partnerships.

Partners

BMAC is a nonprofit community action program that provides services to those who reside in Walla Walla, Garfield, and Columbia counties. All enhanced program services are delivered by the BMAC Housing Program Department.

Medical partners

The Health Center was BMAC's initial referral partner for the start-up grant.

ROE Foundation

The ROE Foundation supports services to elderly citizens in eastern Washington, with a focus on serving rural, distressed areas. The ROE Foundation resources allow BMAC to offer additional accessibility services to seniors.

Services provided by BMAC and these partners are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

Budget

- Enhanced Wx+H Start-up Grant: **\$50,000**
- Leveraged resources: ROE Foundation

Contact Information

Ted Koehler, Coordinator
Housing Services
509-529-4980
tedk@bmacww.org



Energy Program

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Washington State University Energy Program
905 Plum Street SE, P.O. Box 43165
Olympia, Washington 98504

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Blue Mountain Action Council

Table 16. Services Offered by the BMAC Grant

Service	BMAC	The Health Center	ROE Foundation
Outreach and referrals	X	x	
Intake screening/qualification	X		
Initial Healthy Homes assessment	X		
Energy audit/assessment	X		
Service coordination	X	x	
Weatherization	X		
Healthy Homes measures	X		
Client education and follow-up	X		
Additional services (repair, social)	x		x

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 2. Percentage of Wx+H Projects with Healthy Homes and Weatherization Measures Installed (n=7)

Measures	Plus Health Measures		Weatherization Measures		
	All Grantees	BMAC	Measures	All Grantees	BMAC
Green cleaning kit	94%	100%	Air sealing	77%	86%
Bedding (dust mite)	71%	100%	Floor insulation	44%	71%
Mechanical ventilation	65%	57%	Attic insulation	54%	86%
HEPA vacuum	65%	100%	Wall insulation	12%	14%
Walk-off mats	65%	100%	Windows	17%	
CO detector	57%	100%	Door	19%	
Low VOC flooring	33%	86%	Duct insulation	20%	57%
Smoke detector	24%	100%	Duct repair	10%	14%
Advanced ventilation	18%		Duct sealing	33%	29%
HEPA/MEPA filter	17%	71%	HVAC - replace	33%	
HVAC cleaning	17%	86%	Furnace T and Cn	22%	57%
Air filter	15%		HVAC - repair	13%	43%
Plumbing repair	13%		Thermostat	15%	
Gutter, downspout	13%		Passive venting	44%	86%
Moisture/mold abatement	13%		Lighting	33%	57%
Roof repair/replace	11%		WH low cost	52%	71%
Pest mitigation	9%		Water heater	12%	14%
Comprehensive cleaning	8%		Electrical repair	13%	29%
Crawlspace	7%		Wx repair	1%	
Slip/fall prevention	5%	14%			
Dehumidifier	2%				

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles: King County Housing Authority and Public Health – Seattle and King County

The King County Housing Authority (KCHA) is among six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant. KCHA and Public Health – Seattle and King County (Public Health) worked together on a Healthy Homes Demonstration project funded by a HUD grant from 2009 to 2010. Demonstration results showed that weatherization plus education led to better health outcomes than education alone. Close collaboration ended when the HUD grant funding ended.

The Enhanced Grant funding allowed KCHA and Public Health to renew their collaboration and provide combined weatherization and community health and education services. Initially, the grant focused on providing expanded weatherization and Wx+H services to clients participating in the Public Health Asthma Program. When few Asthma Program participants elected or were eligible for Wx+H services, KCHA focused its efforts on serving existing weatherization clients.

KCHA and Public Health provided comprehensive services to 27 households – slightly below its goal of 30 households. An additional 21 households received assessment and education services.

Client who received Wx+H services from KCHA



Wx +H Program

The Wx+H Program, funded by the Washington State Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The initial focus of the Wx+H Enhanced Grant initiative is to assess the effectiveness of integrating weatherization and Healthy Homes services in households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

Program Delivery Strategy

All clients exiting the Asthma Program after three initial home visits were screened and referred to Wx+H. Public Health community health workers (CHWs) provided intensive support, including notary services to encourage Asthma Program participants to sign up for Wx+H services. Upon application, the KCHA auditor completed energy and Healthy Homes assessments and developed a scope of work.

Most completed projects were referred to Public Health from KCHA's existing client queue. On referral, Public Health scheduled three home visits that focused on medication management, identifying respiratory triggers, and adopting Healthy Homes and green cleaning practices.

CHWs delivered and demonstrated low-cost Healthy Homes measures (such as dust mite covers, walk-off mats, and HEPA vacuums). The initial home visits were conducted in the same time period as the KCHA energy audit and Healthy Homes assessment.

All weatherization and Healthy Homes measures were installed by KCHA contractors. Typically,

Washington State Weatherization Plus Health Enhanced Grantee Profiles: King County Housing Authority and Public Health – Seattle and King County

installations lagged initial home visits by 6 to 9 months. Follow-up visits are planned.

Key Lessons

Strong support for the concept and approach

KCHA and Public Health found there was strong support for the Wx+H approach and model. It was easy to explain to stakeholders. As with other Wx+H grantees, contractors, CHWs, and medical providers were willing to go the extra mile to support the program.

Integrating services was hard

The initial HUD demonstration helped put the Asthma Program and Wx+H services on parallel and simultaneous paths. This meant that clients had to meet several people and absorb a lot of information early on. This overwhelmed some clients and contributed to high dropout rates.

In contrast, the Enhanced Grant integrated services by phasing visits. For Asthma Program participants, there was an initial round of home visits for asthma management followed by facilitated referrals to weatherization and Wx+H services. KCHA clients were referred to Public Health CHWs for home visits before KCHA energy assessments.

The KCHA auditor and Public Health CHW indicated they would have benefited from the knowledge, perspective, and notes of the other partner. However, most opportunities for this exchange were missed because structures and processes for sharing information below the management level were not well established.

Client fatigue and application hurdles

The initial expectation was that most participants would transfer from the Public Health Asthma Project; ultimately, only 4 of 27 completed projects were Asthma Project referrals.

The KCHA services application process was a barrier to participation because it requires several steps and detailed documentation. Because KCHA has more demand than services available, the

application process is, as KCHA staff put it, “oriented to the self-motivated.”

Despite the best efforts of CHWs, most of the asthma referrals dropped out because they were ineligible, lived in rental housing, were unable to complete the application process, or were simply too fatigued from the multiple visits and requirements associated with the Public Health Asthma Project.

Lack of stable funding and staffing

Although the CHW model with weatherization has proven to be effective, it had to rely on episodic grant and pilot funding. Without predictable funding, it has been difficult to establish a smooth and efficient program. KCHA’s long-term goal is to move this model from the pilot stage to a more efficient production model.

Unfortunately, this trend of intermittent funding continued. Contracting delays compressed a two-year pilot to 15 months. But just as capacity and sub-contracts for Wx+H were established in April – June 2017, grant funding ended. With the failure of the Legislature to pass a capital budget, future funding is uncertain. There is similar uncertainty with public health funding for CHW services.

Since June 2017, all lead staff for the project at KCHA and at Public Health have either retired or taken other positions.

Avoid restrictions that limit participation

The 2009 to 2010 HUD grant was designed as a structured research project. The research design imposed several restrictions on program design and targets, including serving limited geography (the Highline area of Seattle), language, and use of detailed data collection and reporting tools to meet research requirements.

However, this research focus, which was important to rigorously evaluate outcomes, led to high dropout rates and limited participation. Dropout rates were high when transitioning households

Washington State Weatherization Plus Health Enhanced Grantee Profiles: King County Housing Authority and Public Health – Seattle and King County

from the Asthma Program, but were quite low once households were in the KCHA Wx+H program.

Clients relocate before the end of the intervention

Low-income households tend to relocate frequently. This is a challenge for Wx+H, which delivers services over an extended period (12 – 18 months). Potential clients were asked to commit to staying in their home for at least one year to emphasize the importance of receiving all follow-up services. Initial indications suggest this is working.

Focus on single-family houses

It is difficult to provide Wx+H measures to individual units in multifamily buildings, where only a few occupants may have asthma but the rules require that the whole building be treated. Therefore, KCHA limited services to single-family homes.

Going Forward

Future plans are uncertain. KCHA is working with Public Health to complete follow-up visits. If the Matchmaker Program is funded, KCHA would like the option to provide Healthy Homes measures to supplement weatherization services, and intends to maintain informal referral relationships with Public Health and medical providers. Formal integration would require dedicated funding and a significant investment to build capacity.

Partners

King County Housing Authority is public agency that provides low-income housing services to areas of King County outside of the City of Seattle. KCHA owns and manages almost 3,500 units of subsidized housing and has financed 5,680 additional units. It also operates the Low Income Weatherization and Repair Program

Seattle – King County Public Health is a public health agency serving all of King County. Public Health has been a leader in CHW and home visit programs, and provides services to manage

asthma and respiratory disease. It is also the lead agency for the King County Accountable Community of Health

Other recruitment, referral, and outreach partners include: HealthPoint, Molina Healthcare of Washington, Neighborcare Health, Community Health Plan of Washington, Bellevue School District, and the American Lung Association of the Mountain Pacific.

Services provided by these partners are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

Budget

- Enhanced Wx+H Grant: **\$277,233**
- Leveraged resources: \$125,000 from Public Health Seattle/King County asthma education visits and products delivered to participants leaving the existing Asthma Program.

Contact Information

Heather Eklund, Weatherization Coordinator
King County Housing Authority
206-214-1363; heathere@kcha.org



Energy Program

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Washington State University Energy Program
905 Plum Street SE, P.O. Box 43165
Olympia, Washington 98504



Washington State Weatherization Plus Health Enhanced Grantee Profiles: King County Housing Authority and Public Health – Seattle and King County

Table 17. Services Offered by KCHA and Public Health

Service	KCHA	Public Health	Medical Community Partners
Outreach and referrals	X	x	X
Intake screening/qualification	X	x	
Initial Healthy Homes assessment	x	X	
Energy audit/assessment	X		
Service coordination	X		
Weatherization	X		
Healthy Homes measures	X	x	
Client education and follow-up	x	X	
Additional services (repair, social)	X	x	

LEAD = X, Support = x, *Green shading indicates new partner or existing partner in new role*

Table 18. Percentage of Wx+H Projects with Healthy Homes and Weatherization Measures Installed (n=27)

	Plus Health Measures		Weatherization Measures		
	All Grantees	KCHA		All Grantees	KCHA
Green cleaning kit	94%	100%	Air sealing	77%	60%
Bedding (dust mite)	71%	100%	Floor insulation	44%	68%
Mechanical ventilation	65%	73%	Attic insulation	54%	68%
HEPA vacuum	65%	100%	Wall insulation	12%	28%
Walk-off mats	65%		Windows	17%	28%
CO detector	57%	54%	Doors	19%	16%
Low VOC flooring	33%	46%	Duct insulation	20%	36%
Smoke detector	24%	12%	Duct repair	10%	12%
Advanced ventilation	18%	4%	Duct sealing	33%	48%
HEPA/MEPA filter	17%		HVAC - replace	33%	52%
HVAC cleaning	17%		Furnace T and Cn	22%	24%
Air filter	15%	4%	HVAC - repair	13%	8%
Plumbing repair	13%	8%	Thermostat	15%	16%
Gutter, downspout	13%	4%	Passive venting	44%	44%
Moisture/mold abatement	13%	8%	Lighting	33%	40%
Roof repair, replace	11%	15%	WH low cost	52%	60%
Pest mitigation	9%	8%	Water heater	12%	4%
Comprehensive cleaning	8%		Electrical repair	13%	8%
Crawlspace	7%	38%	Wx repair	1%	8%
Slip/fall prevention	5%				
Dehumidifier	2%				

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles: The Opportunity Council

The Opportunity Council (OC) is one of six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant. OC has offered wraparound Wx+H services to its energy assistance and early childhood education clients for more than ten years, with services targeted to children under age six with asthma. The program is considered a national model and was evaluated by the Oak Ridge National Laboratory (ORNL) in a study published in 2015.²⁵

With the Enhanced Grant funding, OC broadened its focus to include clients of all ages with asthma, chronic obstructive pulmonary disease (COPD), or other respiratory conditions that result in high use of medical services. OC strengthened its referral network in the medical community, refined client education, and expanded follow-up services.

OC provided comprehensive weatherization and/or Healthy Homes services to 36 households – slightly below its target of 40 households. An additional 16 households received lower-cost measures, which was above its target of 10 homes.

Clients who received Wx+H services from OC



¹ ORNL, 2015. *Exploring Potential Impacts of Weatherization and Healthy Homes Interventions on Asthma-related Medicaid Claims and Costs in a Small Cohort in Washington State.*

Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The initial focus of the Wx+H Enhanced Grant initiative is assessing the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

Program Delivery Strategy

OC worked with local clinics and physicians' offices, and the Lummi and Nooksack tribes to identify families with respiratory illness who were high users of medical services. While these referrals generated some leads, most referrals came from energy assistance, weatherization, and early childhood education programs administered by OC.

After receiving a referral, OC education staff visited homes to provide an initial Healthy Homes assessment, which included an assessment of weatherization and Healthy Homes options. The OC project coordinator reviewed the rough scope and scheduled a follow-up audit to develop a full scope of work. The full team (education staff and project coordinators) review project status each week.

All those entering the program, including deferrals and renters, received low-cost measures, education, and follow up visits. All assessment and education services were provided by OC staff. Measures were installed by contractors. Follow-up calls and visits were provided at 1, 3, 9, and 12 months from the date of the first visit.

Washington State Weatherization Plus Health Enhanced Grantee Profiles: The Opportunity Council

Key Lessons

Wx+H services can reduce healthcare costs, especially when heavy users of medical services are targeted

OC participated in a rigorous study conducted by ORNL of 49 households that received Wx+H services between 2006 and 2013. The study found statistically significant reductions in Medicaid costs, especially for high utilizers of medical services.

Finding and serving households with high needs and high use of medical services

Targeting high-need households requires a good definition of high users of medical services and access to medical data. This is challenging, given the importance of maintaining systems to protect medical and personal data.

High-need households are also likely to have complex medical and mental health situations. Homes are more likely to require extensive investments. A number of OC Wx+H projects would have been deferred under existing weatherization protocols. Installed-measure costs for comprehensive installations ranged from \$10,000 to \$30,000, with an average of \$18,000 per home.

OC was able to blend funding from multiple sources to complete these projects, and was particularly effective at accessing utility funding for weatherization measures.

Funding for installed measures came from the following sources:

- DOE, Low Income Home Energy Assistance Program, BPA, Matchmaker: 32%
- Matchmaker, Wx+H: 21%
- Utility: 47%

Not all measures could be addressed

One in five homes had potential measures that were not installed because of spending caps and limited funds. While there was some flexibility in Commerce's "soft cap" for Wx+H measures of

\$4,000 per home, OC staff had to balance the client's needs, building science, and client preferences. For example, in some homes advanced ventilation made sense from a building science perspective, but caps were reached addressing plumbing leaks or replacing carpets.

Education needs and resources should be updated

Expanding the target population from children with asthma to include adults and those with COPD required updating educational tools and content-adjusting approaches. Older clients had more complicated needs and differing motivators (for example, appeals based on a child's health were not always relevant).

Separate and coordinate education and assessment functions

In earlier models, one person provided Healthy Homes assessment and education to occupants. However, the education component did not get the time and attention it deserved. The two functions worked best when delivered by different people who are part of the same team, and who coordinate and reinforce messages and content. Regular coordination and planning meetings were essential.

Streamline and target assessment and follow-up tools

OC reviewed building assessment tools (the Pollution Source Survey and EPA Asthma Checklist) and client questionnaires to combine and simplify them.

Referral relationships were helpful

However, these referrals required significant ongoing effort to maintain.

Evaluate the program holistically

A key finding from prior research is that the sum of the effect of Wx+H services and measures is greater than the individual parts. A corollary observation is that the mix of specific measures, services, and interventions appropriate to meet the needs of the client varies. The ability to tailor the menu of services to meet the needs of the

Washington State Weatherization Plus Health Enhanced Grantee Profiles: The Opportunity Council

household makes a difference. Maintaining this flexibility is important going forward.

Benefits range from reduced medical costs to improved quality of life. It is important to capture and report common data, and to understand and tell the bigger story of how services impact quality of life. OC and contractor [Three³](#) are working with the WSU Energy Program to assess the health and well-being impacts for OC clients.

Going Forward

OC has a long-term commitment to providing Healthy Homes services.

Continue program integration with local medical providers

OC is committed to maintaining its long-standing partnerships with other organizations that provide complementary services, along with mechanisms to coordinate and leverage services where appropriate. This includes the Lummi and Nooksack tribes, the Northwest Clean Air Agency (woodstove replacement in some areas), the City of Bellingham (repair services), Whatcom County Health Department, PeaceHealth Medical Group, Molina Health Care, and Unity Care NW. This will improve the referral process and help with identifying high-need and high-use clients.

In the long-term, OC hopes to explore strategies to integrate community health worker visits into the delivery model. OC has been an active participant in the region's Accountable Community of Health, which is exploring community collaborations and new services to reduce Medicaid costs and improve outcomes.

OC sensed that they were on the cusp of being able to deliver and sustain much more effective and integrated relationships with the medical community when grant funding ended and future funding was suspended when the Legislature failed to pass the capital budget.

Improved outreach and education

OC outreach staff learned a great deal from serving a broader client base and from the experience of enhanced grantees serving older and complex clients. They have strengthened outreach and client support services and tools.

Healthy homes measures

OC is committed to serving this population and providing additional measures if Commerce maintains flexibility and OC can secure funding.

Measuring results

OC is partnering with [Three³](#) and the WSU Energy Program to ensure systems are in place to capture and analyze program services and outcomes data, focusing on medical and healthcare utilization. [Three³](#) conducts research on the integration of environmental, social, and economic sustainability. They were lead researchers on the ORNL study and will build on that work.

Services provided are summarized in Table 1.

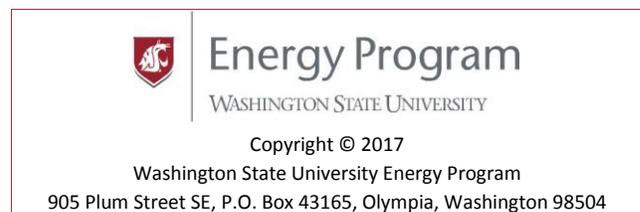
Table 2 summarizes installed Weatherization and Healthy Homes measures.

Budget

- Enhanced Wx+H Grant: **\$556,000**
- Leveraged resources include funds from CDBG Home Repair; HUD Lead Hazard Control; City of Bellingham Mobile Home Repair; Lummi Tribe for energy efficiency and repairs; Puget Sound Energy for energy efficiency, durability, and health; and Northwest Clean Air Agency Wood Smoke Reduction Program

Contact Information

Ross Quigley, Director
Home Improvement Department
360-734-5121; ross_quigley@oppco.org



Washington State Weatherization Plus Health Enhanced Grantee Profiles: The Opportunity Council

Table 19. Services Offered by OC and its Partners

Service	OC	Local Clinics, Medical Providers	Three ³	Tribes	Community Partners
Outreach and referrals	X	x		x	
Intake – screening, qualification	X				
Initial Healthy Homes Assessment	X				
Energy audit/assessment	X				
Service coordination	X			x	
Weatherization	X				
Healthy homes measures	X				
Client education/follow-up	X				
Additional services (repair, social)	X			x	X
Data collection and analysis	X		x		

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 2. Percentage of Projects with Installed Weatherization or Healthy Homes Measures (n=36)

	Plus Health Measures		Weatherization Measures		
	All Grantees	OPPCO		All Grantees	OPPCO
Green cleaning kit	94%	90%	Air sealing	77%	77%
Bedding (dust mite)	71%	80%	Floor insulation	44%	40%
Mechanical ventilation	65%	53%	Attic insulation	54%	51%
HEPA vacuum	65%	63%	Wall insulation	12%	9%
Walk-off mats	65%	84%	Windows	17%	9%
CO detector	57%	43%	Door	19%	3%
Low VOC flooring	33%	18%	Duct insulation	20%	17%
Smoke detector	24%	18%	Duct repair	10%	11%
Advanced ventilation	18%	18%	Duct sealing	33%	23%
HEPA/MEPA filter	17%	8%	HVAC - replace	33%	54%
HVAC cleaning	17%	10%	Furnace T and Cn	22%	9%
Air filter	15%	4%	HVAC - repair	13%	14%
Plumbing repair	13%	14%	Thermostat	15%	
Gutter, downspout	13%	12%	Passive venting	44%	31%
Moisture/mold abatement	13%	18%	Lighting	33%	63%
Roof repair, replace	11%	10%	WH low cost	52%	77%
Pest mitigation	9%	16%	Water heater	12%	6%
Comprehensive cleaning	8%		Electrical repair	13%	14%
Crawlspace	7%	8%	Wx repair	1%	3%
Slip/fall prevention	5%	2%			
Dehumidifier	2%	4%			

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Pierce County Healthy Homes

Pierce County Healthy Homes (PCHH), comprised of Pierce County Human Services (PCHS) and the Tacoma Pierce County Health Department (TPCHD) Partnership, is one of six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant.

The project was originally envisioned as an extension of a decade-long collaboration between PCHS and the [Clean Air for Kids Partnership](#) (CAFK, led by TPCHD) to move beyond referrals for weatherization and minor home repair to offer holistic, integrated services to improve asthma control and quality of life, and to reduce energy costs.

When CAFK public health funding dried up, PCHS stepped up and provided funding for the TPCHD. The focus of the initiative shifted to integrating CAFK's referral network and TPCHD home visit services with PCHS's existing weatherization and home repair program and clients. The project expanded from CAFK's focus on children with asthma to serving all ages, including those with Chronic Obstructive Pulmonary Disease (COPD).

PCHH provided comprehensive weatherization and/or Healthy Homes services to 43 households, exceeding the grant target of 40 projects. An additional 10 households received low-cost measures and home visits, and 84 people with respiratory conditions received services (of which 25% had COPD).



Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The focus of the Wx+H Enhanced Grant initiative is assessing the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma and/or respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

Program Delivery Strategy

The initial strategy of relying heavily on TPCHD community health workers for referrals and pre-qualification was adjusted to focus on existing PCHS clients, including those receiving weatherization, energy assistance, and ECEAP (Head Start) services. This was supplemented by joint outreach events and work with clinics serving low-income households.

Potential clients were referred to TPCHD community health workers, who provided one to three home visits that focused on asthma or respiratory health management, and comprehensive assessment of other needs. Information from TPCHD visits was shared informally with PCHS outreach and auditing staff. Formal systems for sharing information and coordinating services are still being developed.

If clients had not already applied for Wx+H services, a community health worker assisted with the application. Once eligibility for Wx+H services was established, PCHS staff completed a Healthy Homes assessment and provided additional energy and Healthy Homes education that focused on energy management and green cleaning.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Pierce County Healthy Homes

PCHS developed a comprehensive scope of work and contracted it out. TPCHD staff conducted follow-up visits or calls at 3, 9, and 12 months after initial intake. Follow-up visits included comprehensive case management services and detailed data collection on health conditions and needs.

Key Lessons

Meeting complex needs

Provide multiple home visits so complex issues can be addressed and the family treated as a whole. Having additional tools and resources to support meaningful action and interventions is a major morale booster for staff.

Two or three home visits in the first four months are ideal so the clients are not overwhelmed with information and to provide reinforcement. Longer-term follow-ups were beneficial for managing respiratory conditions, and for maintaining green cleaning practices and installed measures. For example, in one home where a ductless heat pump was installed, PCHS found the filters were clogged and needed to be cleaned when they conducted their final inspection three months after installation.

The program's broader focus on all respiratory conditions required developing additional expertise and training materials to address the needs of older clients with COPD.

Many of the projects required addressing complex physical (aging in place) and mental health issues (depression, hoarding). More resources for mental health triage and referral are needed.

High needs, high costs, and long-term engagement

One-third of comprehensive upgrades involved an investment in measures over \$20,000. In many cases, some possible work was not done because of limited funds.

Funding Sources for Installed Measures

Funding for installed measures came from the following sources:

- DOE, Low Income Home Energy Assistance Program, BPA, Matchmaker: 70%
- Matchmaker, Wx+H: 17%
- Utility: 13%
- Other: 5%

PCHS and TPCHD staff reported a high degree of satisfaction at being able to treat the whole house and household. Long-term engagement made a big difference. PCHS staff noted that training on green cleaning and Healthy Homes practices was far more effective after weatherization and measures were installed.

The weatherization application and upgrade was a major barrier to participation

Lower-income households, especially those with a member in fragile health, are often in crisis and may have limited resources and time to meet complex administrative requirements. The multiple touches needed to complete and inspect work, and to participate in education and follow up, was a major barrier, especially for working families.

The highest-need households are very difficult to qualify for low-income weatherization

Often the highest-need households are living in rentals or very deteriorated housing. Initial referrals included more than 20 very high-need Hispanic clients who live in poorly repaired manufactured housing. Most could not be qualified because landlords were non-cooperative, their homes were so deteriorated they were not repairable, or difficulties or reluctance to comply with requirement to qualify people who are not citizens.

Integration of services was a challenge

While TPCHD and PCHS have had long-term referral relationships, services had not been formally integrated and coordinated.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Pierce County Healthy Homes

The partnership tested multiple strategies to strengthen integration, including holding regular coordination meetings, deploying a web-based home visit data collection tool (Redcap) to enable data sharing among the partners, and testing the efficacy of a joint Asthma Community Health Worker (ACHW)/weatherization auditor home visit. Results were mixed. Coordination meetings were helpful, but PCHS and TPCHD were not able to establish cross-agency data sharing systems because of security issues. Also, joint home visits/audits were difficult to schedule and overwhelmed the households.

Wx+H model requires culture change

Long-time energy auditors and outreach staff really struggled with the new processes and prioritizing measures. Auditors needed to audit differently and look beyond energy savings to health needs, and not walk away immediately if there are repair needs. The program is more complex to keep track of. While there was some initial resistance, in June staff noted that the new way of doing business was starting to click with staff.

Contracting processes were a hindrance

As a public agency, PCHS could not initiate contracts until contracts with Commerce were approved. Procurement processes for municipal agencies are very strict and time consuming. Consequently, contracts for some new services were delayed until the last quarter of the project. Existing capacity was strained, leading to delays in completing projects. The average elapsed time from audit to final inspection was 10 months.

Going Forward

PCHS/TPCHD staff engaged in the project are committed to continuing the work, if possible

They felt inspired to see client health and quality of life improve as a result of deep investments in the home. They noted that clients took more responsibility for their health and gained a greater understanding of how their home worked.

During follow-up visits, clients were excited about getting a new, lightweight HEPA vacuum, which they could also use to clean the filter of their new ductless heat pump and refrigerator coils.

There was a strong sense that even if dedicated funding for Wx+H did not continue, program staff would integrate lessons from Wx+H into ongoing program operations. These include:

- Providing mental health training for weatherization program staff
- Providing low-cost education and green cleaning kits
- Including cold plasma filters on ductless heat pump installations
- Maintaining a relationship with TPCHD

Community health worker capacity

Although the value added was high, resources are not sufficient to maintain the asthma community health worker (ACHW) capacity. During the grant, the home visit process was hampered by a lack of consistent, long-term funding for community health workers. Initial delays in Wx+H funding resulted in losing two community health workers to retirement. The rehiring delayed start up until October 2016.

Just when the new hires were getting up to speed in June 2017, failure of the legislature to pass a capital budget (which funds the Matchmaker Program) meant another round of lay-offs.

There is some interest in maintaining ACHW services through Pierce County's Medicaid Waiver – Accountable Community of Health process, but those efforts have yet to yield any stable funding.

Grant Partners

Pierce County Human Services

PCHS provides a wide range of social and human services to Pierce County (excluding the City of Tacoma). The Low Income Weatherization Program is located in the Home and Family Services Division. Seven other divisions offer complementary services, including housing rehabilitation loans,

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Pierce County Healthy Homes

aging and disability services, and the Head Start Program. Where possible, other PCHS programs prioritized Wx+H clients for services such as enhanced repairs or woodstove replacement. They were also a strong source for referrals.

Tacoma Pierce County Health Department Clean Air for Kids

CAFK is a partnership of local healthcare providers, Mary Bridge Children’s Hospital, and schools that provides referrals for ACHW home visits. ACHWs provide asthma and environmental assessments, education, green cleaning supplies, and asthma management plans to families. The program has served 150 to 200 families per year.

Under the original proposal, Wx+H was intended to supplement CAFK. With the loss of public health funding, CAFK home visits were provided only by a small program funded by, and targeted to, the Mary Bridge Children’s Hospital Health System. Wx+H was important in maintaining minimum capacity for asthma home visits by TPCHD.

Puget Sound Asthma Coalition (PSAC)

The PSAC was formed in 2011 by CAFK and other partners, and has grown to include more than 30 organizations and individual members. The coalition supports improved care and prevention services through advocacy, education, outreach, coordination, and standardization of care.

Services provided by the lead and partner organizations are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

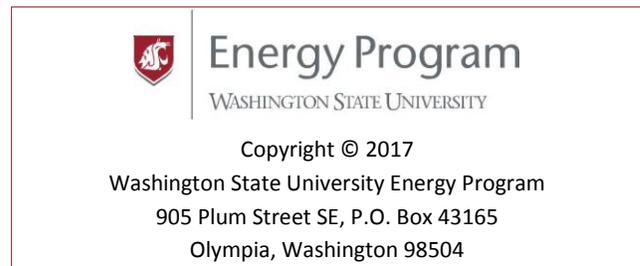
Budget

Enhanced Wx+H Grant: **\$408,042**

Contact Information

Brian Sarensen, Weatherization Supervisor
Pierce County Human Services
253-798-7380; bsarens@co.pierce.wa.us

Judy Olsen, Environmental Health Specialist
Clean Air for Kids
253-798-2954; jolsen@tpchd.org



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Pierce County Healthy Homes

Table 20. Services Offered by PCHH and its Partners

Service	PCHS	TPC Health Dept.	Puget Sound Asthma Coalition Partners
Outreach and referrals	X	x	x
Intake – screening, qualification	X	x	
Initial Healthy Homes Assessment	X	x	
Energy audit/assessment	X		
Service coordination	X	X	
Medical support and management		X	X
Weatherization	X		
Healthy homes measures	X	x	
Client education/follow-up	X	X	
Additional services (repair, social)	X	x	x

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 21 . Percentage of Wx+H Projects with Healthy Homes and Weatherization Measure Installed (n=43)

	Plus Health Measures		Weatherization Measures		
	All Grantees	PCHS		All Grantees	PCHS
Green cleaning kit	94%	88%	Air sealing	77%	77%
Bedding (dust mite)	71%	62%	Floor insulation	44%	56%
Mechanical ventilation	65%	65%	Attic insulation	54%	60%
HEPA vacuum	65%	79%	Wall insulation	12%	2%
Walk-off mats	65%	87%	Windows	17%	7%
CO detector	57%	54%	Door	19%	16%
Low VOC flooring	33%	6%	Duct insulation	20%	23%
Smoke detector	24%	4%	Duct repair	10%	26%
Advanced ventilation	18%	8%	Duct sealing	33%	44%
HEPA/MEPA filter	17%	17%	HVAC - replace	33%	60%
HVAC cleaning	17%	4%	Furnace T and Cn	22%	47%
Air filter	15%	33%	HVAC - repair	13%	16%
Plumbing repair	13%	21%	Thermostat	15%	26%
Gutter, downspout	13%	10%	Passive venting	44%	47%
Moisture/mold abatement	13%	6%	Lighting	33%	47%
Roof repair/replace	11%	21%	WH low cost	52%	65%
Pest mitigation	9%		Water heater	12%	12%
Comprehensive cleaning	8%		Electrical repair	13%	19%
Crawlspace	7%		Wx repair	1%	
Slip/fall prevention	5%	10%			
Dehumidifier	2%	2%			

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Spokane Neighborhood Action Partners

Spokane Neighborhood Action Partners (SNAP) is one of six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant. From 2002 to 2015, SNAP offered the Living Green Program in Spokane County, which provided a Healthy Homes curriculum to the public using workshops, print materials, and a website but did not have resources to provide financial assistance to address problems such as mold and moisture in homes.

SNAP used Enhanced Grant funds to integrate Healthy Homes education and measures into existing weatherization and case management services. SNAP identified potential clients with respiratory issues by providing additional screening to clients in established program pathways supplemented by referrals from new community partners. The project built on SNAP's experience providing holistic, wrap-around services to clients.

SNAP provided education and assessments to 52 households, exceeding its goal of 50. Of these households, 26 received comprehensive weatherization and Healthy Homes measures and 16 received a more modest package of Healthy Homes measures.

Program Delivery Strategy

Clients were identified through SNAP's existing programs like the Energy Assistance and Weatherization programs, multiple outreach events, and referrals from new partners such as medical clinics and local agencies that provide community health worker visits and services.

SNAP intake staff screened clients for eligibility for weatherization services and sought to learn if members of the household may have asthma or another respiratory illness.

The initial energy audit and Wx+H assessment were conducted separately with SNAP's education coordinator. During the initial assessment, the

Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and healthy homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The initial focus of the Wx+H Enhanced Grant initiative is assessing the effectiveness of integrating weatherization and healthy homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver

household received educational guidance and developed a Family Action Plan.

After the energy audit and Wx+H assessment were completed, the auditor and education coordinator developed a proposed scope of work and met jointly with the client to finalize it. Most weatherization measures were installed by SNAP weatherization crews. Healthy Homes measures were installed by contractors.

Three months after measures are installed, SNAP completed an in-home follow-up visit, and will conduct two phone follow-ups at 6 and 12 months.

Key Lessons

Case management and wrap-around services

As this [Case Study](#) illustrates, SNAP has been effective in integrating housing rehabilitation and weatherization services.

However, weatherization program staff generally do not have the resources or training to provide health homes case management services to weatherization clients. Therefore, the Wx+H Program Coordinator joined a regional Community Health Worker network and obtained invaluable training and certification.



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Spokane Neighborhood Action Partners

Broad community support for the Wx+Health comprehensive services

SNAP found it was fairly easy to make a compelling case for comprehensive Wx+H services with community partners. A proposal for support and funding for integrated weatherization and healthy housing services is currently being considered by Better Health Together, the region's Accountable Community of Health supported by the state's Medicaid Waiver.

Community health worker training

Regardless of whether full Wx+H services are provided in the future, community health worker certification and training for SNAP outreach and assessment staff would be valuable in addressing the needs of all weatherization clients and providing appropriate referrals to other community resources. The Wx+H program coordinator provided case management services but indicated that the function was not sustainable without additional resources.

Insufficient resources to meet all needs

Even though SNAP did not specifically target high-need households, many of the homes would have benefited from more intensive interventions. SNAP reported that over half of the Wx+H projects had measures that were not completed due to program limitations.

Commerce's \$4,000 cap on Wx+H expenditures (which could be lifted on review) was considered far too low. More resources to assist in prioritizing Healthy Homes investments would also be helpful.

Pre-screen potential clients with an initial home assessment

SNAP visits 500 to 600 homes a year. Only homes with clear needs for weatherization or other housing services move forward in the program. This existing pathway will be used to screen households for Wx+H services.

SNAP found it was more efficient for them, and more manageable for the client, to conduct Healthy Homes assessments and energy audits separately, and to conduct the initial home visits before a full audit

Education on operating weatherized homes is a key part of service delivery

For many years, SNAP has incorporated education about operating and living in a weatherized home as an integral part of weatherization program delivery. SNAP leveraged its experience with the Living Green Program to ensure that clients have the skills and training to effectively operate upgraded homes.

Building and maintaining capacity

Although SNAP had experience providing general Healthy Homes education, it had less experience offering Healthy Homes measures or targeted education interventions to address respiratory disease. It took time to establish internal policies and procedures, develop expectations with contractors, create assessment tools, build relationships with partners, and create systems to track information and data.

But just as that capacity was established, grant funding ended. It has been very difficult to maintain capacity and momentum in the absence of reliable future funding.

A strong champion

Much of the success of the program was attributed to the efforts the Wx+H Program Coordinator, who worked tirelessly to promote the program inside SNAP and in the community, and provided most of the community outreach, recruitment, and education services to clients. However, much of SNAP's capacity to deliver these services in the future was lost when the Coordinator left SNAP.



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Spokane Neighborhood Action Partners

Meeting data and information needs to support health outcomes research

SNAP's strength is in program delivery, not research. It has set up effective data systems to track and manage weatherization data, but SNAP has less experience tracking and managing data related to Healthy Homes installation measures and outcomes.

Client sensitivity regarding medical self-reporting is a particular concern. SNAP drew on local expertise at the Spokane Regional Health District and WSU Spokane to address this issue, and captured comprehensive data on clients prior to participation. The loss of ongoing funding will significantly restrict post-intervention follow-ups, limiting what we can learn from this investment.

Going Forward

SNAP continues to provide follow-up calls to Wx+H clients. Future plans are contingent on whether additional Matchmaker Funds are available and if the capacity lost by the departure of the Program Coordinator is replaced.

SNAP valued the additional flexibility to install Healthy Homes measures in households with clear health needs. SNAP indicated they would likely continue to provide additional Healthy Homes measures for some clients, especially if there was more flexibility in Healthy Homes spending caps

SNAP outreach staff found value in providing home visits and low-cost measures such as cleaning kits (since the Living Green program funding ended) and HEPA vacuums as part of the services, and would consider continuing to provide that service for some clients if it was allowable.

SNAP will also continue to participate in Better Health Together, the region's Accountable Community of Health to support comprehensive health and housing services.

Partners

SNAP is a nonprofit Community Action Program that provides services to those who reside in Spokane County. All enhanced program services are delivered by SNAP's Housing Improvements Department.

Medical partners

SNAP built referral networks through partners in the medical community such as the Spokane Asthma Clinic, Providence Medical Center, and Better Health Together (Spokane's designated Accountable Community of Health).

Spokane Regional Health District

The Health District has extensive experience with community coalition building, and collecting and managing health outcomes data.

Local government

Spokane city and county governments have made funds and low-interest loans available for home repair and rehabilitation. Eligibility requirements are complex and varied. SNAP helps its clients navigate and connect with the right resources.

Services provided by these partners are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

Budget

Enhanced Wx+H Grant: **\$218,000**

Contact Information

Chris Davis, Director
SNAP Housing Services
509-456-7627 x 2408; davis@snapwa.org



Energy Program

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905 Plum Street SE, P.O. Box 43165

Olympia, Washington 98504



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Spokane Neighborhood Action Partners

Table 22. Services Offered by SNAP

Service	SNAP	Medical Partners	Spokane Regional Health District & WSU	Local Government & Dept. of Commerce
Outreach and referrals	X	x	x	
Intake screening/qualification	X			
Initial Healthy Homes assessment	X			
Energy audit/assessment	X			
Service coordination	X			x
Weatherization	X			
Healthy Homes measures	X			
Client education and follow-up	X			
Data reporting and research	X		x	
Healthy Homes and Lead Hazard Reduction Coalition	X	X	X	X
Additional services (repair, social)	x			X

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 2. Percentage of Wx+H Projects: Healthy Homes and Weatherization Measures Installed (n=42)

Plus Health Measures			Weatherization Measures		
Measure	All Grantees	SNAP	Measure	All Grantees	SNAP
Green cleaning kit	94%	96%	Air sealing	77%	93%
Bedding (Dust mite)	71%	31%	Floor insulation	44%	17%
Mechanical ventilation	65%	62%	Attic insulation	54%	45%
HEPA vacuum	65%	31%	Wall insulation	12%	19%
Walk-off mats	65%	2%	Windows	17%	36%
CO detector	57%	31%	Door	19%	50%
Low VOC flooring	33%	36%	Duct insulation	20%	7%
Smoke detector	24%	31%	Duct repair	10%	2%
Advanced ventilation	18%	20%	Duct sealing	33%	19%
HEPA/MEPA filter	17%	7%	HVAC - replace	33%	19%
HVAC cleaning	17%	58%	Furnace T and Cn	22%	2%
Air filter	15%	4%	HVAC - repair	13%	10%
Plumbing repair	13%	9%	Thermostat	15%	19%
Gutter, downspout	13%	22%	Passive venting	44%	50%
Moisture/mold abatement	13%	13%	Lighting	33%	
Roof repair, replace	11%	7%	WH low cost	52%	19%
Pest mitigation	9%	11%	Water heater	12%	17%
Comprehensive cleaning	8%	42%	Electrical repair	13%	2%
Crawlspace	7%		Wx repair	1%	
Slip/fall prevention	5%	4%			
Dehumidifier	2%				

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Snohomish County Human Services

Snohomish County Human Services (SCHS) is one of six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant. These funds enabled SCHS to provide additional Healthy Homes services and measures to low-income households that include occupants with respiratory conditions.

The SCHS Weatherization Program initially focused on developing referral arrangements with SCHS's Early Childhood Education and Assistance Program (ECEAP), Early Head Start (EHS) Program, Your Air Matters Program, Tribal Healthy Homes Network, and local schools. When these efforts did not yield enough applicants interested or eligible for weatherization services, SCHS focused on identifying existing weatherization clients and applicants with respiratory conditions, and providing additional services to them.

SCHS provided weatherization and Healthy Homes measures and education to 19 households, exceeding its initial target of 18 comprehensive projects. Ten household received assessments, education, and low-cost measures, and 24 people with respiratory conditions were served.

Program Delivery Strategy

When initial outreach efforts did not yield successful applicants, SCHS revised intake and auditing processes to capture information on whether people in households had respiratory conditions. Households meeting these criteria were referred to an auditor with Healthy Homes training who completed the Healthy Homes assessment.



Wx+H Initiative

The Wx+H Initiative, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The focus of the Wx+H Enhanced Grant initiative is assessing the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

SCHS educator and outreach staff reviewed the assessment, and scheduled education and home visits during the upgrade process. Education focused primarily on Healthy Homes and green cleaning. All measure installations were contracted out. Education and follow-up calls and visits were completed by SCHS staff around their other duties.

Key Lessons

Health benefits are compelling

Although it was difficult to get qualified referrals from partners, the benefits and outcomes were compelling and easy to convey to stakeholders. Outreach staff deeply valued the opportunity to connect and work with clients in the home visit process. In their words, "It chokes me up thinking about the difference we made in people's lives."

Existing applicants have significant health needs

SCHS attempted to develop an extensive referral and outreach network, anticipating that it would be hard to find households with respiratory health concerns among existing clients. SCHS staff were somewhat surprised at how common and extensive health concerns were among existing clients.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Snohomish County Human Services

Developing referral relationships takes time

Initial efforts to develop referral relationships were not successful with early childhood education programs (ECEAP and EHS). Due to late start up for Wx+H, the early school sign-up window was missed. Families with young children are also less likely to be homeowners and, therefore, are much more challenging to qualify for weatherization. Outreach efforts to rural school districts were met with skepticism of government services. While there was some initial interest in engagement from the Tulalip Tribe, it takes significant investment and time to build trust and relationships in tribal setting. Ultimately, none of the comprehensive projects SCHS completed were referred from initial partners.

Weatherization application process is a barrier

As with other grantees, SCHS found that the application process was a significant barrier to participation. The application requires extensive documentation of income, assets, and citizenship. Further, the process places additional requirements and restrictions on rental properties.

To address some of these issues, SCHS requested that households who has established income eligibility for other programs such as ECEAP be granted “categorical” eligibility for Wx+H as way to ease the application requirements. This was determined to not meet documentation requirements attached to U.S. DOE and U.S. Department of Health and Human Services – LIHEAP weatherization funding was not approved.

Contracting challenges

SCHS status as a municipal organization made it much more challenging to contract for services. Grant startup was delayed because the contract needed to be approved by the County Council. Contracting for Wx+H measures could not begin until the original contract was signed. County procurement rules are complex and difficult to negotiate, even for “simple purchases” like green cleaning kits or HEPA vacuums.

Existing weatherization contractors were generally not interested in providing Healthy Homes measures. For example, when flooring was sent out for bid, only one contractor (with very limited capacity) responded. Consequently, flooring and other approved Healthy Homes measures were not offered because of lack of contractor capacity.

Healthy Homes education works better after installation

SCHS outreach staff found that Healthy Homes education had far more traction with clients when offered after or in tandem with measure installation.

Going Forward

The initial management sponsor for the Wx+H program at SCHS Weatherization Services retired during the early rollout the program. While there was general support for Wx+H services, there was limited capacity and organization bandwidth to work with the broader community, referral partners, and stakeholders. The focus of the SCHS grant became meeting the grant’s basic requirements and delivering the project as a modest extension of existing weatherization services. SCHS returned about 40% of its grant to Commerce unspent.

Raising awareness of the health needs of existing clients

The Wx+H program raised program and staff awareness of the health needs of existing clients. Staff indicated that there was value in screening for health conditions in the future.

Limited capacity to provide Healthy Homes services

SCHS primarily see themselves as offering weatherization services. Much of the extra work for Wx+H was done around existing duties.

Outreach and education staff did not feel they had the expertise or training to address the clients’ health issues. Nor was SCHS able to establish adequate contracting infrastructure to deliver comprehensive Wx+H services. There was some

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Snohomish County Human Services

interest in having the option to provide a limited number of lower-cost Healthy Homes measures and education, such as green cleaning training for households with respiratory illness or other health conditions.

Partners

SCHS provides comprehensive social and health services including weatherization and energy assistance to Snohomish County. ECEAP, EHS, and the Case Management Program all deploy community health workers for home visits as part of their services. The weatherization program did reach out to these programs, which resulted in a limited number of referrals

Air Matters Program

The [Air Matters](#) program works within the Tribal Healthy Homes Network, which serves the Tulalip Tribes and other tribes in the region to provide low- and no-cost Healthy Homes measures and educational material. SCHS initially contracted with Air Matters for green cleaning kits and client education tools. Due to cost and availability considerations, SCHS eventually assembled the kits themselves.

Local schools

ECEAP/EHS already works closely with local school districts to identify “at-risk” households, and to provide prevention and support services. SCHS reached out to these groups but did not have the time or resources to adequately maintain referral relationships.

Services provided by SCHS and these partners are summarized in Tables 1. Table 2 summarizes installed weatherization Healthy Homes measures.

Budget

Enhanced Wx+H Grant: **\$137,500**

SCHS funded most measures from existing low-income weatherization and Wx+H funding. About one percent of installed measure costs were leveraged from other sources.

Installed Healthy Homes and Weatherization measures cost an average of \$9,364. Funding for installed measures came from the following sources:

- DOE, Low Income Home Energy Assistance Program, BPA, Matchmaker: 68%
- Matchmaker, Wx+H: 27%
- Utility: 5%
- Other: 1%

Contact Information

Mathew Bell, Supervisor
Housing & Community Services
M/S 305
Everett, WA 98201
425-388-7202; mathew.bell@snoco.org



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Washington State University Energy Program
905 Plum Street SE, P.O. Box 43165
Olympia, Washington 98504

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Snohomish County Human Services

Table 1. Services Provided by the Snohomish County Partnership

Service	SCHS (Wx)	SCHS (ECEAP/EHS)	Your Air Matters	Local Schools
Outreach and referrals	X	x	x	x
Intake/screening/qualification	X			
Initial Healthy Homes Assessment	X			
Energy audit/assessment	X			
Service coordination	x	x		
Weatherization	X			
Healthy Homes measures	X			
Client education – follow-up	X			
Additional services (repair, social)	x	x		

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 2. Percentage of Wx+H Projects with Healthy Homes and Weatherization Measures Installed (n=19)

	Plus Health Measures			Weatherization Measures	
	All Grantees	Snohomish		All Grantees	Snohomish
Green cleaning kit	94%	100%	Air sealing	77%	95%
Bedding (dust mite)	71%	86%	Floor insulation	44%	84%
Mechanical ventilation	65%	86%	Attic insulation	54%	84%
HEPA vacuum	65%	57%	Wall insulation	12%	11%
Walk-off mats	65%	95%	Windows	17%	21%
CO detector	57%	71%	Door	19%	16%
Low VOC flooring	33%		Duct insulation	20%	53%
Smoke detector	24%	29%	Duct repair	10%	
Advanced ventilation	18%	10%	Duct sealing	33%	68%
HEPA/MEPA filter	17%	57%	HVAC - replace	33%	16%
HVAC cleaning	17%		Furnace T and Cn	22%	63%
Air filter	15%		HVAC - repair	13%	37%
Plumbing repair	13%	19%	Thermostat	15%	21%
Gutter, downspout	13%	38%	Passive venting	44%	74%
Moisture/mold abatement	13%		Lighting	33%	11%
Roof repair, replace	11%	5%	WH low cost	52%	79%
Pest mitigation	9%	24%	Water heater	12%	11%
Comprehensive cleaning	8%		Electrical repair	13%	32%
Crawlspace	7%	10%	Wx repair	1%	
Slip/fall prevention	5%				
Dehumidifier	2%				

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Yakima Valley Farm Workers Clinic

The Yakima Valley Farmworkers Clinic (YVFWC) is one of six public service agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Grant. YVFWC has operated the Asthma Home Visiting Program (AHVP) for 14 years as part of its mission as a community and migrant health center to provide healthcare services to low-income households. AHVP has successfully reduced emergency and urgent care visits for clients with newly diagnosed or uncontrolled asthma by providing medication management and education to help reduce environmental asthma triggers (such as keeping homes dry, clean, and well ventilated).

The Wx+H grant was targeted to remove financial barriers that prevented some clients from following through on recommendations in asthma action plans, especially for higher-cost weatherization and repair. The Enhanced Grant also supported efforts to coordinate services between YVFWC AHVP and YVFWC's Northwest Community Action Center (NCAC), which provides low-income households with weatherization, improved ventilation, moisture control, and green cleaning measures. The grant also supported additional home visits and follow-up services.

YVFWC AHVP and NCAC worked together to provide comprehensive weatherization and Healthy Homes services to 14 households, and a more limited package of Healthy Homes measures to 28 households. YVFWC AHVP provided assessments, home visits, and/or low-cost measures to an additional 67 households.

Program Delivery Strategy

YVFWC AHVP screened its patients to find income-qualified households where one or more member has newly diagnosed or uncontrolled asthma. Service areas include Toppenish, Grandview, and Prosser. Of these screened households, 100 received AHVP visits and low-cost measures such as green cleaning kits. NCAC also took referrals from its weatherization and energy assistance

Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The initial focus of the Wx+H Enhanced Grant initiative is to assess the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

applicants, but fewer than five met the requirement for uncontrolled asthma.

The AHVP used a focused protocol of three initial visits. The first visit focused on asthma awareness and an initial review of triggers. The second visit explored triggers in more detail. The third visit was recap.

Generally, but not always, the NCAC energy auditor completed an energy audit and healthy home assessment between the second and third home visit. The auditor developed a scope work for Healthy Homes and weatherization measures.

Most measures were installed by crews. Where possible, the work was done in phases so Healthy Homes measures could be installed as early as possible. The crews then circled back to complete weatherization measures. Follow-up visits occur at 6 and 12 months from the initial home visit. Given delays in installing measures, final follow-up visits are occurring about 9 month after final inspection for comprehensive projects and 6 months for Healthy Homes-only projects.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Yakima Valley Farm Workers Clinic

Key Lessons

The AHVP model is effective at reducing emergency room and urgent care visits, and had a positive impact on clients

The program has tested referral protocols and established solid referral relationships with the YVFWC medical clinic system and with local hospitals. The AHVP has also tested tools and protocols for providing home visit services focused on asthma.

NCAC found the collaborating with the AHVP and linking its work to respiratory health generated a much more positive response than its ongoing weatherization work. This included client letters and feedback given during follow-up visits, good press, and feedback from community stakeholders.

Working in an agricultural area

The partnership with AHVP was essential to meet the unique needs of clients in agricultural areas. Healthy Homes education and measures needed to address pesticide exposure (taking shoes off before entering the home) and smoke from extensive wildfires (keeping windows closed and ventilation systems on). Many of the clients were agricultural workers and were very difficult to schedule. There were also heightened concerns over citizenship issues.

Rental homes/landlords

A significant proportion of homes served by the AHVP are rentals. Landlords are less willing to meet the conditions to receive low-income Wx+H services.

Rental properties comprised the largest share of those who were not eligible for comprehensive services. But the collaboration with AHVP ensured that households who did not qualify for weatherization and Healthy Homes measures were still able to receive education and low-cost measures.

A phased approach

YVFWC set its initial service targets and plan with the expectation that Enhanced Grant funds could be used for weatherization measures. When this turned out not to be the case, NCAC found that it had insufficient funding to complete comprehensive upgrades on all the homes it committed to. NCAC moved to a phased approach where Healthy Homes measures were prioritized and installed first. The phased approach meant the program served more households, but fewer homes received comprehensive upgrades or comprehensive upgrades were delayed.

Coordination

Although the YVFWC AHVP and NCAC programs had an informal referral relationship, they had not worked together closely before. NCAC established a new connection with the clinic. Joint meetings over the course of the grant resulted in raising general awareness of each program's services.

There was fairly close coordination between NCAC intake staff and the AHVP program staff. A plan for AHVP and NCAC auditors to team up to do a joint assessment of potential weatherization and Healthy Homes service needs during the second asthma home visit did not materialize due scheduling and staffing issues.

The AHVP did use the statewide Weatherization Information Data System for some reporting and information sharing. Coordination between weatherization staff and community health workers on specific projects, beyond scheduling, was limited.

Staff turnover

The lead implementation staff at NCAC and AHVP turned over during the projects. As with many of the grantees, staff turnover presented a challenge when developing and sustaining regular communication, and providing day-to-day coordination.

Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Yakima Valley Farm Workers Clinic

Culture change

The Wx+H program required a significant change in how NCAC auditors, inspectors, and contractors approached their work. It was hard to move auditors and crew off the mindset that there were strict limits on health and safety expenditures.

Auditors were in the practice of automatically walking away from projects if costs for repairs and health and safety measures exceeded 25% of total costs. Instead, auditors should look for reasonable opportunities to address these issues in addition to meeting energy savings targets.

Intake staff were challenged by the idea that the program was not available to all people eligible for weatherization because it was targeted to those with uncontrolled asthma. But by the end of the grant period, staff were beginning to understand this constraint.

Contracting

NCAC is a crew-based weatherization agency. Wx+H required new contracts for pest control and comprehensive cleaning, measures NCAC crews did not provide. Unlike other agencies, YVFWC was able to use a request for qualifications process to get new contractors on board prior to start up.

While NCAC crews installed flooring, it was challenging to source low-VOC flooring locally.

It was also more complicated to sequence work appropriately. Typically, pest management work needed to occur before the crew could go onsite, and comprehensive clean up would occur after weatherization work.

Going Forward

One of the important outcomes from Wx+H was raising mutual awareness of the AHVP and Weatherization Service, which is likely to strengthen future ongoing referral patterns and relationships. Additional Wx+H funding will allow the AHVP to provide follow-up visits to existing clients.

Additional dedicated funding is needed to continue to provide coordinated services and home visits. Currently, this funding is not likely because this is not a priority for the region's Accountable Community of Health (Medicaid 1115 Waiver); in addition, future Matchmaker funding is uncertain. There are no local plans to do follow-up research.

If Matchmaker funding becomes available, YVFWC is not likely to go forward with a fully integrated services model with the AHVP. However, there is interest in having more flexibility to integrate additional Healthy Homes measures into existing weatherization projects.

Our Partners

The Enhanced Grant enabled three programs within the YVFWC to work closely together. The YVFWC medical clinics have a strong and well-developed relationship with AHVP. The Enhanced Grant supported the addition of Healthy Homes measures to weatherization services provided by NCAC crews and contractors, and the integration of services into the work of AHVP.

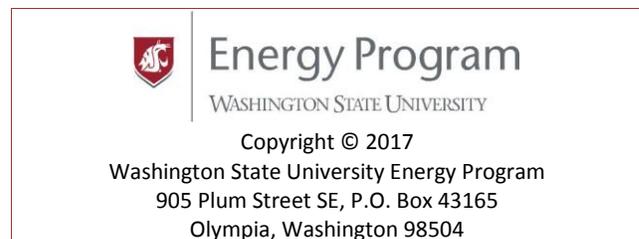
Services provided by the lead and each of these partners are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

Budget

- Enhanced Wx+H Grant: **\$362,955**
- Leveraged resources: Home visit services from the Asthma Home Visit Program

Contact Information

Janice Gonzales, Weatherization Program Manager
Northwest Community Action Center
Yakima Valley Farm Worker's Clinic
509-865-7630; JaniceG@yfwc.org



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Yakima Valley Farm Workers Clinic

Table 23. Services Offered by YVFWC and Partners

Service	YVFWC – AHVP	YVFWC – NCAC	YVFWC – Medical
Outreach and referrals	X	x	x
Intake screening/qualification	x	X	
Initial Healthy Homes assessment	x	X	
Energy audit/assessment		X	
Service coordination	x	x	
Weatherization		X	
Healthy Homes measures	x	X	
Client education and follow-up	X	x	
Additional services (repair, social)	x	X	

LEAD = **X**, Support = x, Green shading indicates new partner or existing partner in new role

Table 24. Percentage of Wx+H Projects with Healthy Homes and Weatherization Measures Installed (n=42)

	Plus Health Measures		Weatherization Measures		
	All Grantees	Farm Workers		All Grantees	Farm Workers
Green cleaning kit	94%	98%	Air sealing	77%	57%
Bedding (dust mite)	71%	95%	Floor insulation	44%	19%
Mechanical ventilation	65%	69%	Attic insulation	54%	21%
HEPA vacuum	65%	57%	Wall insulation	12%	10%
Walk-off mats	65%	95%	Windows	17%	2%
CO detector	57%	86%	Door	19%	10%
Low VOC flooring	33%	79%	Duct insulation	20%	2%
Smoke detector	24%	33%	Duct repair	10%	
Advanced ventilation	18%	36%	Duct sealing	33%	17%
HEPA/MEPA filter	17%	24%	HVAC - replace	33%	
HVAC cleaning	17%	7%	Furnace T and Cn	22%	2%
Air filter	15%	19%	HVAC - repair	13%	2%
Plumbing repair	13%	7%	Thermostat	15%	5%
Gutter, downspout	13%	7%	Passive venting	44%	17%
Moisture/mold abatement	13%	19%	Lighting	33%	31%
Roof repair, replace	11%	7%	WH low cost	52%	24%
Pest mitigation	9%	5%	Water heater	12%	17%
Comprehensive cleaning	8%		Electrical repair	13%	
Crawlspace	7%		Wx repair	1%	
Slip/fall prevention	5%	2%			
Dehumidifier	2%	2%			

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

Washington State Weatherization Plus Health Enhanced Grantee Profiles: Yakama Nation Housing Authority

The Yakama Nation Housing Authority (YNHA) is one of two local agencies in Washington to receive an Enhanced Weatherization Plus Health (Wx+H) Start-Up Grant. These grants are intended to build on existing capacity and prepare grantees for full participation in upcoming Wx+H program cycles.

While the YNHA has been providing weatherization and minor repairs since April 2010, resources for extended Healthy Homes interventions have been limited. YNHA staff and crews had limited experience providing Healthy Homes assessments and installing Healthy Homes measures. YNHA used the funds to build internal capacity. YNHA's planned partnership with the Indian Health Service/Department of Environmental Health Services to obtain referrals and provide home visit services was slow to develop. YNHA then focused on its own clients and provided services with existing staff.

YNHA met its goal of providing comprehensive upgrades to seven households.

Wx+H clients (front) and the YNHA Wx+H team (back)



Program Delivery Strategy

YNHA focused Wx+H resources on owner-occupied homes of tribal members that were eligible for services. YNHA screened applicants for health needs and made extensive use of peer and

Wx+H Program

The Wx+H Program, funded by Washington State's Energy Matchmaker Program, integrates investments in energy efficiency and Healthy Homes improvements in low-income households with education and services to reduce energy bills; increase home durability; and improve occupant health, safety, and well-being.

The initial focus of the Wx+H Enhanced Grant initiative is to assess the effectiveness of integrating weatherization and Healthy Homes services to serve households with members who have asthma or other respiratory illnesses. Enhanced grants are intended to support pilot projects to develop, test, and deploy new measures, strategies, and partnerships to deliver services.

family networks to spread word of the program and services.

The YNHA newly hired Weatherization Coordinator handled outreach, intake and application, and Healthy Homes assessment and education, and coordinated with the energy auditor. All weatherization and Healthy Homes measures were installed by YNHA crews.

Two follow-up visits at 6 and 12 months after measure installation are planned.

Key Lessons

There is significant demand and need for Wx+H case management and wrap-around services

Asthma and respiratory conditions are significant concerns for members of the Yakama Nation. According to the Washington State Department of Health (2013), the statewide asthma rate for Native Americans and Alaska Natives (AI/AN) is nearly double that of the general population. About one-quarter of the AI/AN people with income at or below 200% of the federal poverty level have asthma.

YNHA found many of its existing clients had respiratory conditions, and it was not difficult to



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Yakama Nation Housing Authority

find eligible household through word of mouth and informal networks after efforts to establish a formal referral relationship with the Indian Health Service, Division of Environmental Health Services (IHS/DEHS), did not work out.

High needs, high costs

As with other grantees, YNHA found that the households with the highest needs lived in homes that were in very poor condition. A significant percentage of projects could not be addressed even with additional Wx+H funding because of issues like uncontrolled pets in the home, drug use, or general deterioration. Wx+H funding allowed work to be done on some homes that would otherwise be walk-aways. At the same time, YNHA reported that all Wx+H projects included one or more measure, which would have benefited the household, but could not be completed due to funding constraints.

Follow-up visits provided feedback to the households and YNHA

The Weatherization Coordinator observed significant changes in the home occupants' health and well-being after measures were installed. In one household, the person with respiratory illness went from sleeping 12-18 hours a day to a normal sleeping pattern, and reengaged with family and the community. In another household, the Coordinator noticed dramatic changes in the physical appearance, energy levels, and asthma symptoms among home occupants. Many of the changes in well-being are not necessarily captured in asthma home visit protocols.

It was very powerful for program staff to see the positive impacts of their work.

Multiple, complex health issues

YNHA found that household members had multiple and complex health issues. Asthma and respiratory conditions were not often the biggest concerns or the issues that weatherization and/or Healthy Homes services would address. The focus

exclusively on asthma could sometimes be a "check the box" event. It was also clear that YNHA staff, like most other weatherization staff, do not have the training and skills to address more complex health concerns.

Partnership challenges

YNHA was not able to establish a working partnership with IHS/DEHS, even though there was strong potential. The IHS/DEHS has offered asthma home visit services since 2014 to members of the Yakama Nation. The IHS/DEHS has had limited resources to address underlying environmental triggers for respiratory conditions in the home.

Three factors inhibited the partnership:

- First, the start-up grant was not large or long enough for YNHA and IHS/DEHS to invest in the systems needed to integrate services.
- Second, Commerce required that all people who receive funding to provide Wx+H assessments, education, and quality control inspections have completed Healthy Homes Essentials training. Only one staff person at IHS/DEHS had completed the training. Training was not available or easy to access in a timely fashion.
- Third, it takes time and capacity to build relationships, and both entities were understaffed during start up.

Unique challenges with Yakama Nation

Additional challenges are unique to tribes and tribal housing authorities. The YNHA serves all members of the Yakama Nation, regardless of where they live. Potential participants in the program live some distance away from YNHA offices and in areas served by other low-income weatherization agencies.

Establishing client trust is particularly important. There is a heavy reliance on peer and family networks in tribal settings. Outsiders are viewed



Washington State Weatherization Plus Health Enhanced Grantee Profiles:

Yakama Nation Housing Authority

with deep skepticism and distrust. Relationships with clients or among managers take time and patience to build.

Going Forward

The YNHA appreciated the flexibility of the Wx+H program to address additional health and safety needs in homes. There was strong interest in having the option to install additional Healthy Homes measures. With existing funding, only a handful of projects would likely get these measures. Dedicated funding would provide the opportunity to provide more of these measures.

In the near term, there is little remaining capacity to provide outreach and case management services because there continues to be turnover in the Weatherization Coordinator position. Additional and more stable funding is needed to re-establish this capacity.

Partners

YNHA is a tribal housing authority with the mission to provide safe, decent, affordable, and healthy housing for the families of the Yakama Nation. YNHA provides services to members of the Yakama Nation living on the Yakama Indian Reservation and surrounding communities. The YNHA provides weatherization and Healthy Homes assessments and upgrades.

Efforts to establish a formal referral relationship with the IHS/DEHS did not work out.

Services provided by the YNHA are summarized in Table 1. Table 2 lists eligible Healthy Homes measures.

Budget

- Enhanced Wx+H Start-up Grant: **\$50,000**

Contact Information

David Olivas, Weatherization Department Manager
Yakama Nation Housing Authority
509-877-6171; David@ynha.com



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905 Plum Street SE, P.O. Box 43165

Olympia, Washington 98504



Washington State Weatherization Plus Health Enhanced Grantee Profiles: Yakama Nation Housing Authority

Table 25. Services Offered by the YNHA

Service	YNHA	IHS Division of Environmental Health Services
Outreach and referrals	X	x
Intake screening/qualification	X	
Initial Healthy Homes assessment	X	
Energy audit/assessment	X	
Service coordination	X	
Weatherization	X	
Healthy Homes measures	X	
Client education and follow-up	X	
Data reporting and research	X	
Additional services (repair, social)	X	

LEAD = X, Support = x, Green shading indicates new partner or existing partner in new role

Table 2. Percentage of Wx+H Projects with Healthy Homes and Weatherization Measure Installed (n=7)

	Plus Health Measures		Weatherization Measures		
	All Grantees	YNHA		All Grantees	YNHA
Green cleaning kit	94%	100%	Air sealing	77%	100%
Bedding (dust mite)	71%		Floor insulation	44%	86%
Mechanical ventilation	65%	71%	Attic insulation	54%	100%
HEPA vacuum	65%	100%	Wall insulation	12%	14%
Walk-off mats	65%	100%	Windows	17%	57%
CO detector	57%	100%	Door	19%	14%
Low VOC flooring	33%	71%	Duct insulation	20%	29%
Smoke detector	24%	86%	Duct repair	10%	43%
Advanced ventilation	18%	57%	Duct sealing	33%	43%
HEPA/MEPA filter	17%		HVAC - replace	33%	57%
HVAC cleaning	17%		Furnace T and Cn	22%	29%
Air filter	15%	100%	HVAC - repair	13%	
Plumbing repair	13%	14%	Thermostat	15%	43%
Gutter, downspout	13%		Passive venting	44%	100%
Moisture/mold abatement	13%	57%	Lighting	33%	14%
Roof repair, replace	11%		WH low cost	52%	100%
Pest mitigation	9%	14%	Water heater	12%	14%
Comprehensive cleaning	8%	14%	Electrical repair	13%	57%
Crawlspace	7%	29%	Wx repair	1%	
Slip/fall prevention	5%	29%			
Dehumidifier	2%	29%			

Darker cell colors indicate higher rates of installation.

Blank cells indicate that a measure was not installed by the grantee.

